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Programmable Logic Controller

XG-PM

XGT Series

User's Manual

XGF-PO1H XGF-PD1H
XGF-PO2H XGF-PD2H
XGF-PO3H XGF-PD3H
XGF-PO4H XGF-PD4H

Safety Instructions

- Read this manual carefully before installing, wiring, operating, servicing or inspecting this equipment.
- Keep this manual within easy reach for quick reference.

LS Industrial Systems

Before using the product …

For your safety and effective operation, please read the safety instructions thoroughly before using the product.

- Safety Instructions should always be observed in order to prevent accident or risk with the safe and proper use the product.

- Instructions are divided into “Warning” and “Caution”, and the meaning of the terms is as follows.

⚠ **Warning**	This symbol indicates the possibility of serious injury or death if some applicable instruction is violated
⚠ **Caution**	This symbol indicates the possibility of severe or slight injury, and property damages if some applicable instruction is violated

Moreover, even classified events under its caution category may develop into serious accidents relying on situations. Therefore we strongly advise users to observe all precautions properly just like warnings.

- The marks displayed on the product and in the user’s manual have the following meanings.

  ⚠ Be careful! Danger may be expected.

  ⚠ Be careful! Electric shock may occur.

- The user’s manual even after read shall be kept available and accessible to any user of the product.

Safety Instructions for design process

⚠ Warning

- **Please install a protection circuit on the exterior of PLC so that the whole system may operate safely regardless of failures from external power or PLC.** Any abnormal output or operation from PLC may cause serious problems to safety in whole system.
  - Install protection units on the exterior of PLC like an interlock circuit that deals with opposite operations such as emergency stop, protection circuit, and forward/reverse rotation or install an interlock circuit that deals with high/low limit under its position controls.
  - If any system error (watch-dog timer error, module installation error, etc.) is detected during CPU operation in PLC, all output signals are designed to be turned off and stopped for safety. However, there are cases when output signals remain active due to device failures in Relay and TR which can't be detected. Thus, you are recommended to install an addition circuit to monitor the output status for those critical outputs which may cause significant problems.
- **Never overload more than rated current of output module nor allow to have a short circuit**. Over current for a long period time maycause a fire .
- **Never let the external power of the output circuit to be on earlier than PLC power**, which may cause accidents from abnormal output oroperation.
- **Please install interlock circuits in the sequence program for safe operations in the system when exchange data with PLC or modify operation modes using a computer or other external equipments** Read specific instructions thoroughly when conducting control operations with PLC.

Safety Instructions for design process

⚠ Caution

- **I/O signal or communication line shall be wired at least 100mm away from a high-voltage cable or power line.** Fail to follow this

Safety Instructions on installation process

⚠ Caution

- **Use PLC only in the environment specified in PLC manual or general standard of data sheet.** If not, electric shock, fire, abnormal operation of the product may be caused.
- **Before install or remove the module, be sure PLC power is off.** If not, electric shock or damage on the product may be caused.
- **Be sure that every module is securely attached after adding a module or an extension connector.** If the product is installed loosely or incorrectly, abnormal operation, error or dropping may be caused. In addition, contact failures under poor cable installation will be causing malfunctions as well.
- **Be sure that screws get tighten securely under vibrating environments.** Fail to do so will put the product under direct vibrations which will cause electric shock, fire and abnormal operation.
- **Do not come in contact with conducting parts in each module**, which may cause electric shock, malfunctions or abnormal operation.

Safety Instructions for wiring process

⚠ Warning

- **Prior to wiring works, make sure that every power is turned off.** If not, electric shock or damage on the product may be caused.
- **After wiring process is done, make sure that terminal covers are installed properly before its use.** Fail to install the cover may cause electric shocks.

⚠ Caution

- **Check rated voltages and terminal arrangements in each product prior to its wiring process.** Applying incorrect voltages other than rated voltages and misarrangement among terminals may cause fire or malfunctions.
- **Secure terminal screws tightly applying with specified torque.** If the screws get loose, short circuit, fire or abnormal operation may be caused. Securing screws too tightly will cause damages to the module or malfunctions, short circuit, and dropping.
- **Be sure to earth to the ground using Class 3 wires for FG terminals which is exclusively used for PLC**. If the terminals not grounded correctly, abnormal operation or electric shock may be caused.
- **Don't let any foreign materials such as wiring waste inside the module while wiring,** which may cause fire, damage on the product or abnormal operation.
- **Make sure that pressed terminals get tighten following the specified torque. External connector type shall be pressed or soldered using proper equipments.**

Safety Instructions for test-operation and maintenance

⚠ Warning

- **Don't touch the terminal when powered**. Electric shock or abnormal operation may occur.
- **Prior to cleaning or tightening the terminal screws, let all the external power off including PLC power.** If not, electric shock or abnormal operation may occur.
- **Don't let the battery recharged, disassembled, heated, short or soldered**. Heat, explosion or ignition may cause injuries or fire.

⚠ Caution

- **Do not make modifications or disassemble each module.** Fire, electric shock or abnormal operation may occur.
- **Prior to installing or disassembling the module, let all the external power off including PLC power.** If not, electric shock or abnormal operation may occur.
- **Keep any wireless equipment such as walkie-talkie or cell phones at least 30cm away from PLC**. If not, abnormal operation may be caused.
- **When making a modification on programs or using run to modify functions under PLC operations, read and comprehend all contents in the manual fully.** Mismanagement will cause damages to products and accidents.
- **Avoid any physical impact to the battery and prevent it from dropping as well.** Damages to battery may cause leakage from its fluid. When battery was dropped or exposed under strong impact, never reuse the battery again. Moreover skilled workers are needed when exchanging batteries.

Safety Instructions for waste disposal

⚠ Caution

- **Product or battery waste shall be processed as industrial waste.** The waste may discharge toxic materials or explode itself.

Revision History

Version	Date	Remark	Page
V 1.0	’09. 8	First Edition	-

※ The number of User’s manual is indicated right part of the back cover.

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◎ Contents ◎

Chapter 1 Overview 1-1

Chapter 2 System composition ..... 2-1 ~ 2-2

2.1 System Composition 2-1
2.2 Motion Environment 2-2

Chapter 3 Function Table 3-1

3.1 Function Table 3-1

Chapter 4 Start & End of XG-PM..... 4-1 ~ 4-2

4.1 Start of XG-PM 4-1
4.2 The End of XG-PM 4-2

Chapter 5 Composition & the way of basic using of operation screen ..... 5-1 ~ 5-9

5.1 Screen Composition 5-1
5.2 The Way of Basic Using 5-2
5.2.1 Menu composition 5-2
5.2.2 Collecting Tool 5-6
5.2.3 Status Bar 5-8
5.2.4 Conversion of Viewing Window 5-8
5.2.5 How to Use Communication Box 5-9

Chapter 6 Drawing Up of Project ..... 6-1 ~ 6-17

6.1 Composition of Project 6-1
6.2 Managing Project File 6-2
6.2.1 Make a New Project 6-2
6.2.2 Open Project 6-3
6.2.3 Saving Project 6-4
6.2.4 Saving as Other Name 6-4
6.3 Open APM File 6-5
6.4 Project Item 6-6
6.4.1 Add Item 6-6

6.4.2 Read Item From File 6-7
6.4.3 Saving Item as File 6-10
6.4.4 Item Registration Information 6-13
6.5 Project Password 6-15
6.5.1 Setting Password 6-15
6.5.2 Password Modification 6-16
6.5.2 Delete password 6-17

Chapter 7 Check System ..... 7-1 ~ 7-4

7.1 Connect PLC 7-1
7.1.1 Setting Local Connection 7-1
7.1.2 Module Connection & Confirm connection 7-3
7.2 Confirm Module O/S Information 7-4

Chapter 8 Setting Data ..... 8-1 ~ 8-15

8.1 Setting Common Parameter 8-1
8.2 Setting Operation parameter 8-2
8.3 Setting operation data 8-6
8.4 Setting Electronic CAM 8-8
8.4.1 Confirm of CAM special character curve 8-9
8.4.2 Confirm CAM graph 8-10
8.5 Simulation 8-11
8.5.1 Execution of Simulator 8-11
8.5.2 External I/O setting of Simulator 8-12
8.5.3 Simulator screen control function 8-12
8.5.4 Sight of simulator support function 8-13

Chapter 9 Write/Read/Comparison data ..... 9-1 ~ 9-3

9.1 Write data 9-1
9.2 Read data 9-2
9.3 Comparison Data 9-3

Chapter 10 Test Run by XG-PM ..... 10-1 ~ 10-20

10.1 Composition of a Picture of Test Run 10-1
10.1.1 Composite command screen 10-1
10.1.2 System View 10-2
10.1.3 Screen of External Input/Output Signal 10-3
10.1.4 Error Message Screen 10-3
10.2 Test Run Mode 10-4
10.2.1 Select Operation Command Axis 10-4
10.2.2 Implementation 10-4
10.2.3 Test Run 10-5
10.2.4 Jog Operation 10-9
10.3 Command Icon 10-10
10.4 Example of Test Run 10-11
10.4.1 Jog Operation 10-11
10.4.2 Direct Start (Shortcut position control) 10-12
10.4.3 Indirect Start (Shortcut position control and circular interpolation) 10-14
10.4.4 Speed Synch 10-18

Chapter11 Useful Function of XG-PM..... 11-1 ~ 11-53

11.1 Project Management Function 11-1
11.1.1 Project Initialization Function 11-1
11.1.2 Multi-Module Batch Write/Read/Comparison 11-4
11.2 Editing Data Function 11-7
11.2.1 Copy/Paste 11-7
11.2.2 Set Value of Initial Data 11-8
11.2.3 Cancel/Restart Edition 11-9
11.2.4 Auto fill 11-9
11.2.5 Unit Auto Changing Function 11-10
11.3 Copy Data 11-11
11.3.1 Copy for Each Data Item 11-11
11.3.2 Copy for Each Axis Data 11-12
11.3.3 Copy Data for Each Module 11-13
11.4 Online Model Setting 11-14
11.4.1 Module Synchro Function 11-15
11.4.2 Data Synchro Function 11-19
11.5 Project Printing 11-21

11.5.1 Printing setting 11-22
11.5.2 Space Setting 11-23
11.5.3 Header/Footer Setting 11-24
11.5.4 Cover Printing Setting 11-25
11.6 Trend monitor 11-27
11.6.1 Begin to Trend Monitor 11-27
11.6.2 Trend Monitor Setting 11-28
11.6.3 Graph Setting 11-30
11.6.4 Setting Graph Window 11-32
11.6.5 Graph Function 11-33
11.7 Data Trace 11-36
11.7.1 Connection 11-38
11.7.2 Trace setting 11-38
11.7.3 XY Trace Setting 11-42
11.7.4 XYZ Trace Setting 11-43
11.7.5 Graph Setting 11-44
11.7.6 XY Graph Setting 11-45
11.7.7 XYZ Graph Setting 11-46
11.7.8 Trace 11-47
11.7.9 Playing Trace 11-48
11.7.10 Graph Function 11-49
11.7.11 File Function 11-49
11.7.12 View Function 11-50
11.8 Electronic CAM 11-52
11.8.1 Creating electronic CAM profile 11-52
11.8.2 Proceeding electronic CAM 11-53

What is the difference APM software package with XGPM ……APP1-1

Appendix1.1 Difference function APP1-1

Warranty and Environmental Policy

About User's Manual

Congratulations on purchasing PLC of LS Industrial System Co.,Ltd.
Before use, make sure to carefully read and understand the User's Manual about the functions, performances, installation and programming of the product you purchased in order for correct use and importantly, let the end user and maintenance administrator to be provided with the User's Manual.

The User's Manual describes the product. If necessary, you may refer to the following description and order accordingly. In addition, you may connect our website(http://eng.lsis.biz/) and download the information as a PDF file.

Relevant User's Manuals

Title	Description	No. of User's Manual
XG5000 IEC User's Manual	It describes how to use XG5000 software, which it is applied to the IEC standard language, especially about online functions such as programming, printing, monitoring and debugging by using XGT series products.	10310000834
XGK/XGB Instructions & Programming User's Manual	It is the user's manual for programming to explain how to use commands that are used PLC system with XGK/XGB CPU.	10310000833
XGI CPU User's Manual	It describes CPU specifications and technical terms for the XGT PLC system using a series of XGI CPU module.	10310000832
XGR CPU User's Manual	It describes CPU specifications and technical terms for the XGT PLC system using a series of XGR CPU module.	10310000855

Chapter 1 Overview

This manual describes the function and operation method of XG-PM.

XG-PM is the software that controls positioning modules corresponding to CPU of XGT PLC series and carries out the functions below.

Setting Parameter, Data of Positioning Module

Simulating by Positioning Data

Reading/Writing data on Positioning Module and comparing data with module

Monitoring in Positioning Control status

Test operating of Positioning Control

These are the positioning module that XG-PM can be applied to

Positioning module types	Models
Open Collector Ouput	XGF-PO1H, XGF-PO2H, XGF-PO3H, XGF-PO4H
Line Drive Output	XGF-PD1H, XGF-PD2H, XGF-PD3H, XGF-PD4H

1.1 Characteristics

(1) Application of intuitive icon design

Intuitive icon design is applied for user to operate more easily.

(2) Three-dimensional Structure to check data Easily and Quickly.

Users can check external I/O signal and error history easily and quickly even while data monitoring. Especially, users can check error information and solutions on monitoring screen and can be given much help from it. In addition, the state of external I/O signal is displayed in various colors for user to check conveniently.

(3) Multi-Communication

XG-PM and XG5000are possible to connect at the same time witout extra work for connection.

(4) Editing and Monitoring Data of Several modules at a time

XG-PM can edit data of several positioning module connected to XGT PLC and monitor several modules at a time. When users install several modules, the modules will be installed easily and quickly.

(5) Simulator Function

XG-PM has simulator for positioning module so simulation is possible to execute before real operating. User can check the movement of positioning module through the simulator and prevent some unexpected errors.

(6) Compatible with Former APM Software Package

XG-PM can read files written in former APM software package and convert it into the project file for XG-PM.

(7) Various Monitor Function

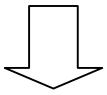
XG-PM provides various forms of operation monitoring function. User can check the information about servo easily with system view function and analyze the operating state of module in another way with two-dimensional trend and trace function.

1.2 Construction of Manual

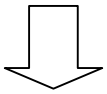
This manual consists of 11 chapters and appendix.

This manual hypothesize that users execute from confirmation of positioning control system to operation in the order below.

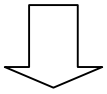
Sequence1 – Install and wire positioning control system.	Reference
Install and wire PLC, servo amp, motor, external equipment and PLC such as XGT CPU, XGF-PO1H, XGF-PO2H, XGF-PO3H, XGF-PO4H, XGF-PD1H, XGF-PD2H, XGF-PD3H, XGF-PD4H module, I/O module, Specialfunction module etc	Refer to user's manual of positioning module pulse ouput type



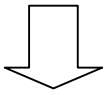
Sequence2 - Learn the function and working of XG-PM	Reference
Check the system can be used with XG-PM	Chapter 2
Check the function can be used with XG-PM	Chapter 3
Install and start XG-PM	Chapter 4
Learn the operating method and the construction of monitor screen	Chapter 5



Sequence3 – Execute function of XG-PM	Reference
Write a project with XG-PM	Chapter 6



Sequence4 – Check the connection state of positioning module with system and the initial state.	Reference
Select a port to connect to positioning module and etc	Chapter 7
Check the positioning module type and module information	
Check the state of positioning module(Warning/Error)	
Check the state of servo connected to positioning module	
Check the operation of servo motor by JOG operation	



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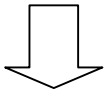
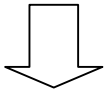
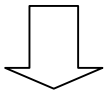


Sequence5 – Set data and write into positioning module	Reference
Set parameter according to positioning control system and control method	Chapter 8
Check positioning data through the simulation	
Check the state of positioning data by automatic error check function for setting data	
Write/Read/Compare the data set on project	Chapter 9



Sequence6 – Execute test operating and check/modify the setting	Reference
Connect to module and have module ready to execute test operating	Chapter 10
Check the operating state set on module through JOG operation, Direct, Indirect start and Speed synch. operation	
Check the state of positioning control by monitor	

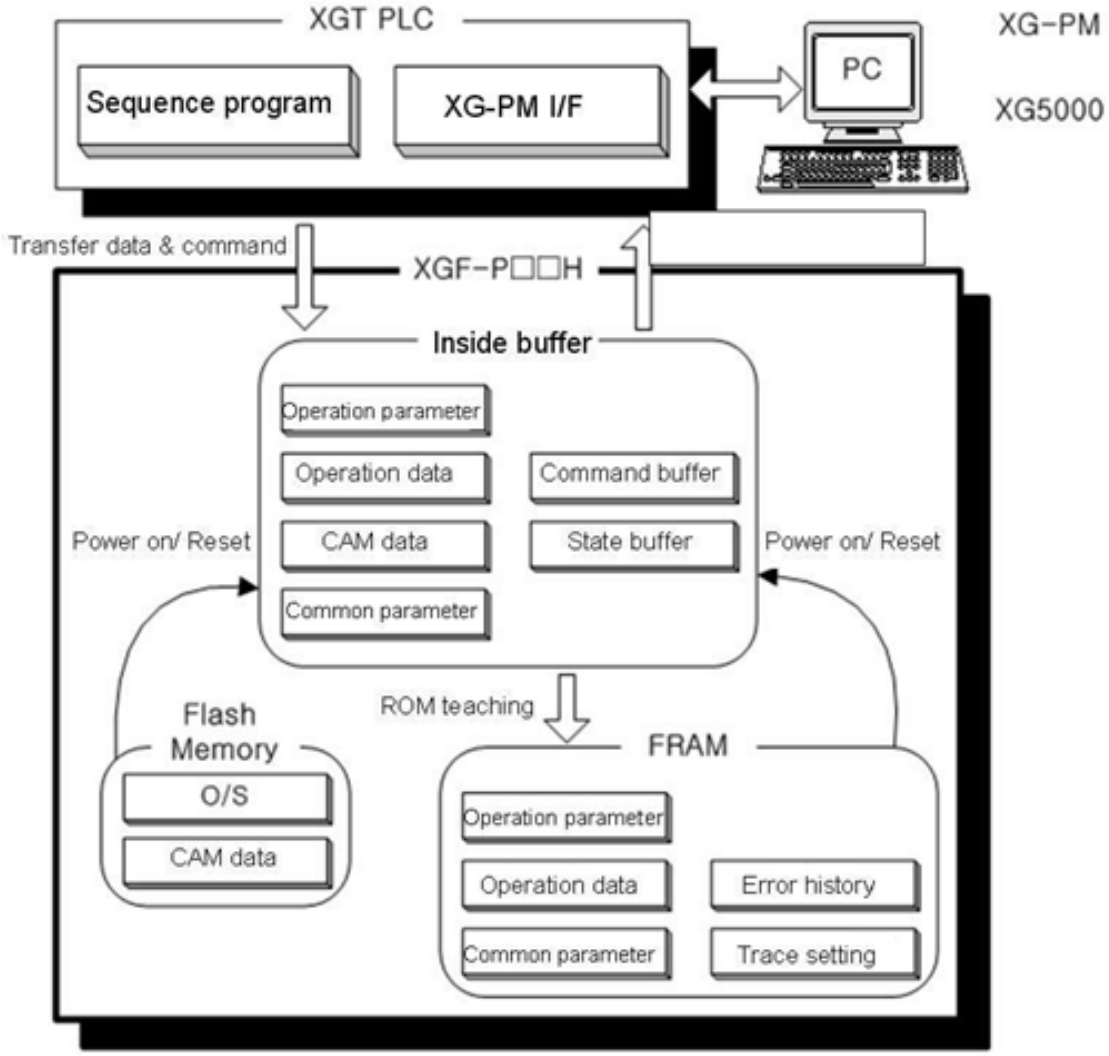


Sequence7 – Operate positioning control system	Reference
Operate positioning control system by PLC CPU program	Refer to user's manual of positioning module pulse ouput type

Chapter 2 System composition

2.1 System Composition

This drawing describes flow of data when setting data and checking the operation status by XG-PM



2.2 Motion Environment

XG-PM motion environment is as follows ;

Item		Content
Peripherals	PC	Using Windows PC
	CPU module	CPU module corresponding to XGT CPU series
Standard of motion PC	CPU	Over Pentium processor
	Memory	Over 128MB
	HDD disk	the least over 60MB empty space
	telecommunications environment	RS-232C or USB
	Display	Resolution of over 1024*768
	Windows environment	Windows 2000/XP/Vista environment
XGT CPU module version	XGK CPU	Over V2.2
	XGI CPU	Over V2.2
	XGR CPU	

Chapter 3 Function Table

3.1 Function Table

Here describes important function of XG-PM.

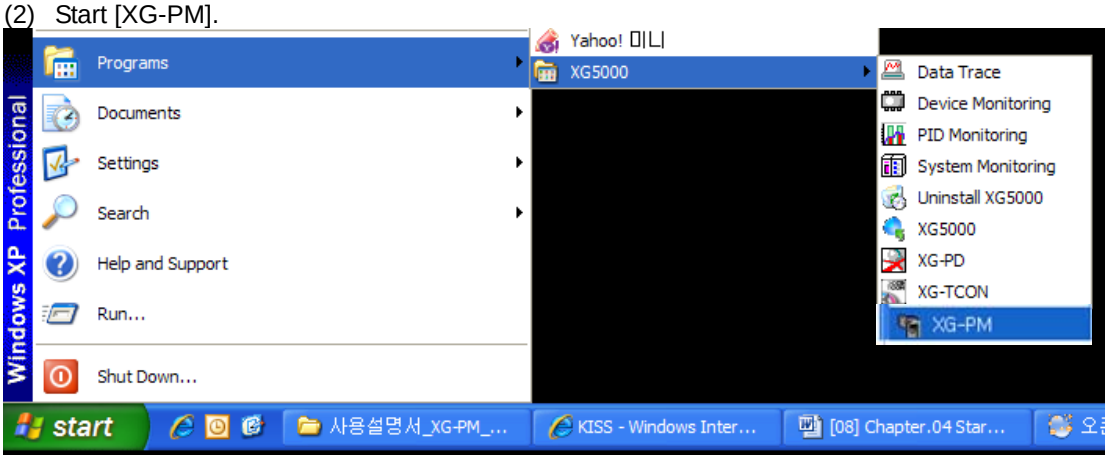
Function			Content
Editing	Setting Parameter		Sets common, basic, expansion, manual operation, homing and external signal parameter.
	Setting Operation Data		Sets control method, operation method, accerelation/deceleration time, M code and circular interpolation data per axis unit.
Monitor	Monitor Position Data		Monitors positioning data in operation
	Monitor Operating Motion - Monitor Error Records - Monitor External Signal - Monitor Motion		Monitors position, speed value, situation, etc of all axes.
			Monitors recorded error, warning, etc of all axes.
			Monitors external signal of all axes.
			Monitors motion situation of all axes.
	Trand monitor		Expresses positioning data in operation by graph.
Test	Editing positioning data		Write setting parameter, operation data to module in operation and monitoring
	Motion Test	Indirecting start	Assign positioning data, step number and execute test.
		Directing start	Directly sets position, speed, dwell time, M code, acceleration&deceleration time and tests positioning operation.
		Position change	Tests target position change in positioning operation.
		Speed change	Tests speed change to axis of positioning.
		interpolation	Edits data of linear interpolation, circular interpolation, elliptic interpolation, helical interpolation and tests.
		Cam operation	Tests cam operation from created profile by setting cam parameter.
		Step change	Tests by Positioning operation after changing starting step of positioning operation.
		Teaching operation	Tests operation of single teaching, plural teaching.
		Inching operation	Tests operating designated distance per each operation.
		MPG operation	Tests operation by manual pulse generator (MPG).
	Simulation		Simulates motion of positioning module.
Check of connection	Confirm connection		Expresses signal from external. Tests initial operation by JOG operation.
Trace	Bit/Word Trace		Expresses situation bit information & position speed information in operation. Can express Maximum 8 items.
	XY Trace		Expresses position/speed information using by 2 dimensions in operation. Can express Maximum 4 items.
	XYZ Trace		Expresses position/speed information using by 3 dimensions in operation.
Expansive Function	Cam operation		Tests cam operation by created profile for operating cam.
Printing Function	Individual print		Prints each setting display.
	Project print		Prints whole project.

Chapter 4 Start & End of XG-PM

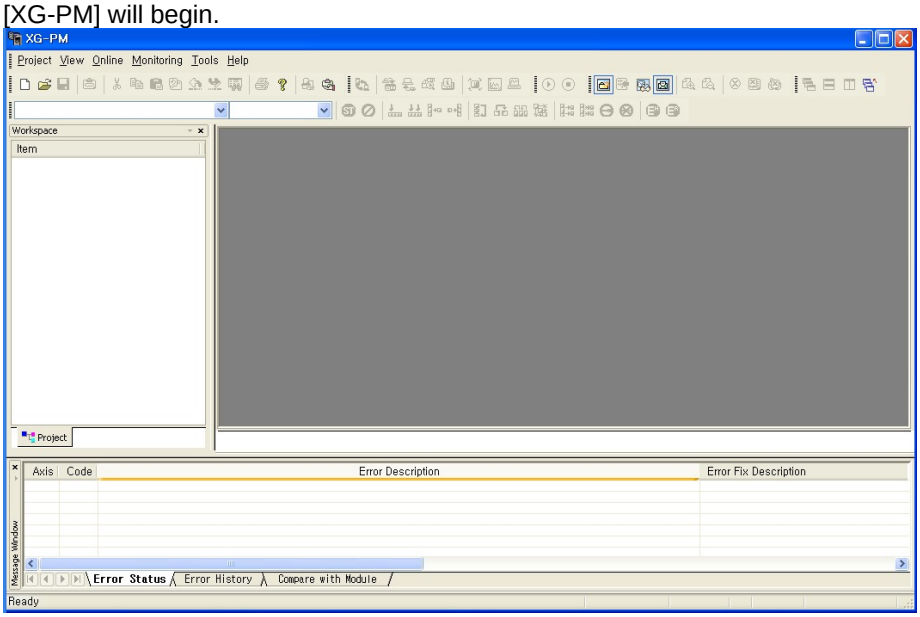
4.1 Start of XG-PM

Here describes the way of using XG-PM by windows.

(1) Move cursor as follows: [Start]->[Programs]->[XG5000]->[XG-PM].
(2) Start [XG-PM].



(3) [XG-PM] will begin.

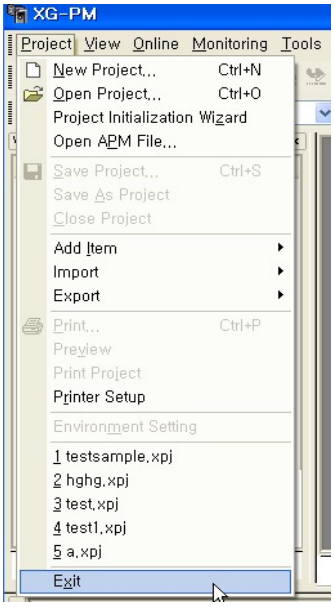


4.2 The End of XG-PM

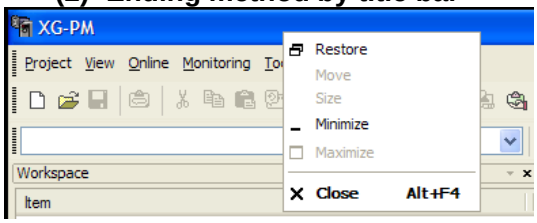
Here describes the way of ending XG-PM.

(1) Ending method by menu

(a) Execute [Project]->[Exit].
(b) XG-PM is ended.

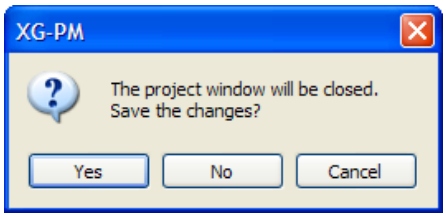


(2) Ending method by title bar



Note

If it is ended without saving change after changing project data, project saving window is displayed for asking save of project.

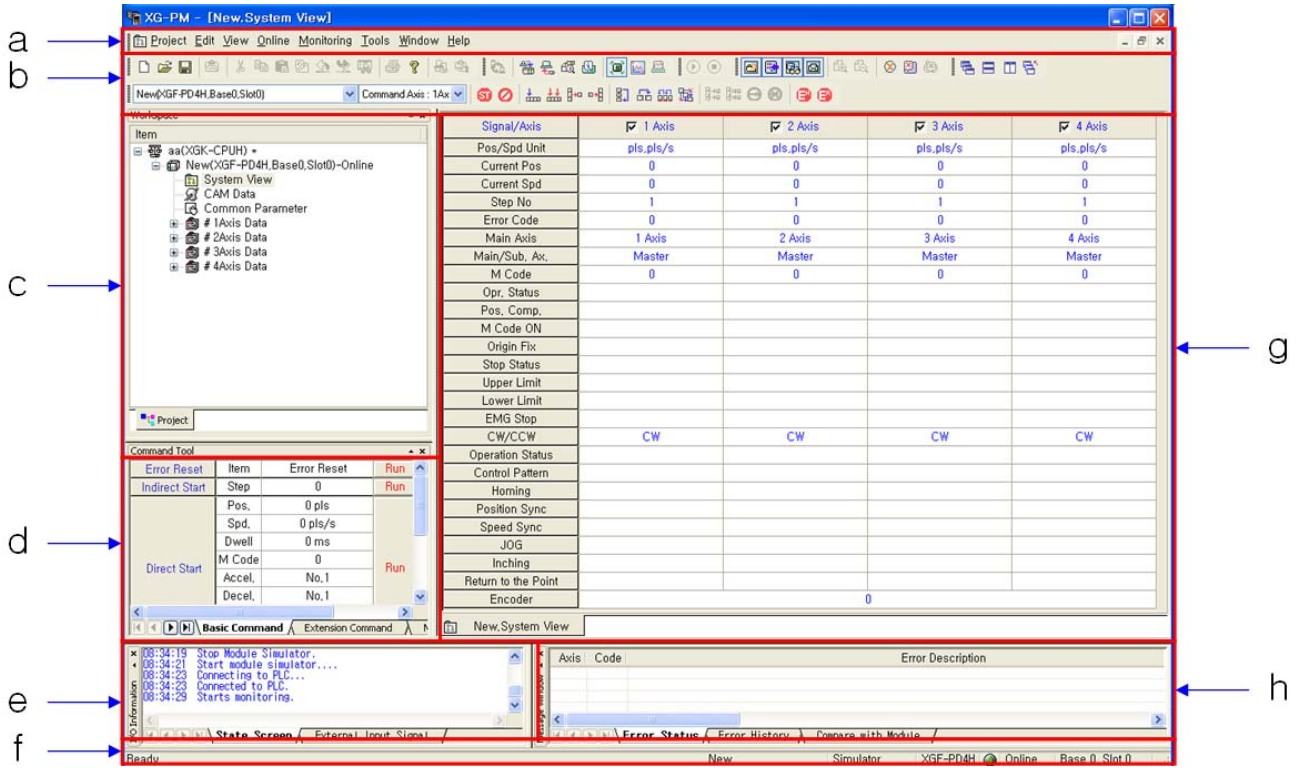


Click <Yes> button, end program with saving project.
Click <No> button, end program without saving project.
Click <Cancel> button, cancel ending program.

Chapter 5 Composition & the way of basic using of operation screen

5.1 Screen Composition

The XG-PM screen composition is as follows;



No.	Item	Description
a	Menu	This is basic menu for each operation
b	Tool bar	For convenience, it displays Shotcuts
c	Project window	Provides some function (searching between module, add module, data copy between axises, etc), Can setting expository writing and password of project.
d	Command window	It is easy of performance because It gathered commands for module test.
e	Input/output window	Monitors input signal from external device.
f	Situation Bar	Displays connecting situation and position of positioning module.
g	System view (operating information)	Displays operating information of selected module.
h	Message window	Displays each axis error & error history of selected module. And when module compared with data, the result data was displayed to screen.

5.2 The Way of Basic Using

Here describes the way of basic using of XG-PM

5.2.1 Menu composition

When you select menu, commands will be displayed. Select the command with mouse or key to execute commands. If the menu has shortcut key, you can directly execute by shortcut key.

(1) Project

Command		Description
New project		Creat project first time
Open project		Open established project
Project initialization wizard		Open new project. User don't need to write a separate data for operation after performing initialization wizard.
Open APM file		Read '*.apm' file from APM software, convert to XG-PM project file (*.xpj).
Save project		Save project.
Save other name		Save the project as other name.
Close project		Close the project.
Add item	Module	Add new module to project.
Import	Module data	Read module data from file.
	Cam setting data	Read setting data for creating cam profile from file.
	Common parameter	Read common parameter data from file.
	Operation parameter	Read operating parameter data from file.
	Operation data	Read operating data from file.
Export	Configuration file	Save the selected item about setting from project window.
	CSV file	Save file as CSV file form with project window.
Print		Print the activated window.
Preview		It will show you window for printing.
Print project		Print the selected project item.
Printer Setup		Select printer option.
Recents project		Display latest 20 projects.
End		End XG-PM.

(2) Edit

Command	Description
Default Prameter Setting	Initialize selected data of cell territory.
Undo	Cancel edition with selected window and back to former times.
Redo	Restore canceled editing performance.
Detail Parameter Setting	Open detailed parameter window from operating parameter.
Cut	Initialize data which is selected in cell territory, and copy to clipboard.
Copy	Copy to clipboard data which is selected in cell territory.
Paste	Copy data to selected cell territory from clipboard.
Delete	Delete data which is selected.

(3) View

Command	Description
Project window	Show or hide project window.
Command window	Show or hide command window.
Input/output window	Show or hide Input/output window.
Message window	Show or hide message window.
Basic tool	Show or hide basic tool.
Online tool	Show or hide online tool.
View tool	Show or hide view tool.
Command tool	Show or hide command tool.
Error Status	Activate error status tab in message window.
Error History	Activate error history tab in message window.
View value of the bit	Will be displayed only when trand monitor window is revitalized. Revital viewing window of present value on the graph.
View value of trand	Displayed only when trand monitor window is revitalized. Revital viewing window of present value on the trand graph.
View value of XY graph	Will be displayed only when XY graph monitor window is revitalized. Revital viewing window of present value on the XY graph.
Registration information	Revital information dialog box which is selected by project window. Ex) Project & Module information

(4) Graph (Menu is displayed only when trand monitor window is Revitalized)

Command	Description
Show cursor	Display or hide cursor for displaying data.
Scroll synchro	Synchro bit graph and width scroll of trand graph. At the same time, can be compared bit graph with data of trand graph
Expansion axis X	Extend screen axis X.
Reduction axis X	Contract screen axis X
Back again Axis X	Show you screen axis X as origin rate.
Expansion axis Y	Show screen of axis Y.
Reduction axis Y	Show screen of axis Y more small.
Back again axis Y	Show screen of axis Y as origin size.
Auto-adjustment axis X	Auto-adjust screen for displaying axis X data at a screen.
Auto-adjustment axis Y	Auto-adjust screen for displaying axis Y data at a screen.
Saving Bitmap	Save present screen as bitmap file.
Saving text	Save present screen as TEXT file (.csv).
Copy clipboard	Copy present screen to clipboard.
Setting graph	Set screen color, line color, index color of present screen.
Setting trand device	Register or delete device what you want monitoring.
Setting screen	Setting graph type which you want displaying. And setting whether you see the data value of graph or not.

(5) Online

Command	Description
Connecting/Cancel connecting	Connect with PLC or cancel.
Set connect	Setting the way of connection.
Write	Write data in the module.
Read	Read the data from module.
Module and comparision	Compared Module with setted data of project, Display result on “the compare with module“ tab of the message window.
Initializing Module	Initialize operating parameter of module and cam setting data.
Set online model	Check the module with online, and add to project module. And can read data of module when it seleted.
Module information	Display present module information with online on the screen.
OS download	Update OS of present module with online.

(6) Monitor

Command	Description
Monitor Start/End	Start/End monitor.
Trand monitor	Operate trand monitor.
Data trace	Assign device and Monitoring data changing.

(7) Tool

Command	Description
Starting simulator	Start simulator.
Custom	Make definition of tool, word of command by user.
Setting Shortcut key	Set shortcut key by user.
Option	Setting items (basic folder/ the number of back up file/ the number of latest project/ former project opening option) when create new project.

(8) Window

Command	Description
Tiers of arrangement	Arrange windows like tiers in XG-PM
Horizontal arrangement	Horizontally arrange windows in XG-PM.
Perpendicular arrangement	Perpendicularly arrange windows in XG-PM.
Close to all	Close all of the windows in XG-PM.
Icon fall in	Order windows(minimum size as Icon condition) standing in line in XG-PM.

(9) Help

Command	Description
XG-PM help	Open help XG-PM.
Homepage of LS industrial system	Link to homepage of LS industrial system
XG-PM information	Displaying XG-PM information.

5.2.2 Collecting Tool

We provide shortcut for useful menu with XG-PM. It will begin to operate with click on the tool icon.

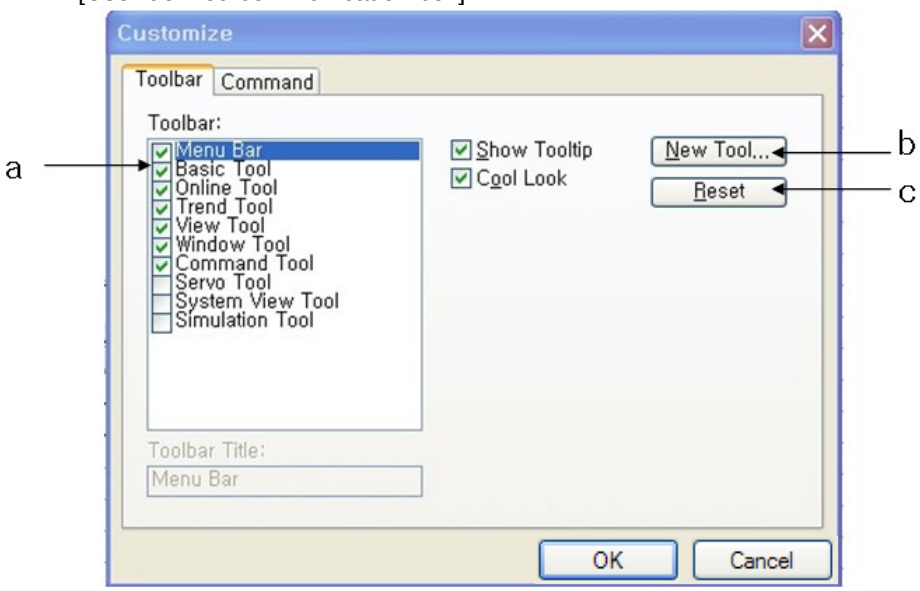
(1) Make a new collection of tool

You can make a new Collecting tool.

[Sequence]

1) Select like this : Menu [Tool]->[Customize]
2) Click on the new tool button.
3) Input the name at the new collection of tool communication box.
4) Click on the confirm button. Then, will be create new empty tool box.

[User-defined communication box]



[Communication box description]

a) Tool collection: Check the checkboxes which were placed in front of the each tool name.
b) New tool: Make the new tool collection.
c) Reset: Initialize tool collection.

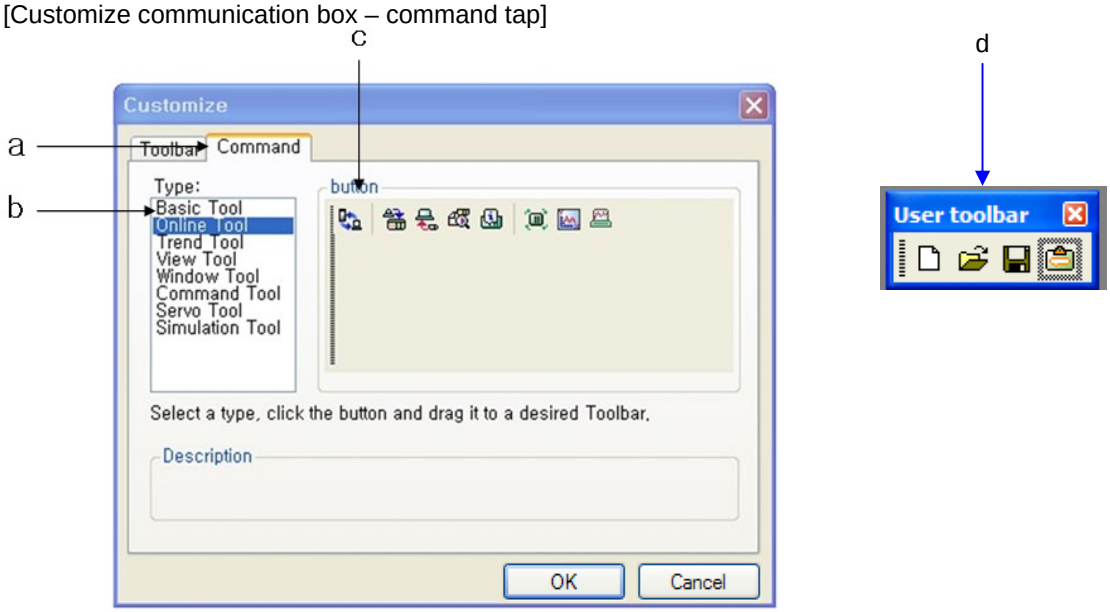
(2) Fill the tool collection

Fill the tool in the new tool collection.

[Sequence]

1) Select the command tab in the user-defined communication box.
2) Fill the commands which were needed to use in the new created tool collection.

[Customize communication box – command tap]



[communication box description]

a) Command : This is the command tab of user communication box.
b) Type : Select the existing tool collection.
c) Button : select tool that you need.
d) User toolbar: drag tool you want into user tool box to add tool.

5.2.3 Status Bar

User can confirm editing condition, online location or condition of selected module, etc by status bar.

[Explaining picture]

a) Explaining command / Indicating data range : It means selected menu & command, explain of tool collection.
When it is editing data, data range will be displayed on the screen.
b) Module name: Display selected module.
c) Model name of module: Display model name of selected module.
d) Displaying connection by picture: Display On-line/Off-line of selected module using by picture.
e) Displaying connection: Display On-line/Off-line of selected module.
f) Displaying connected location: Display location where selected module is installed.

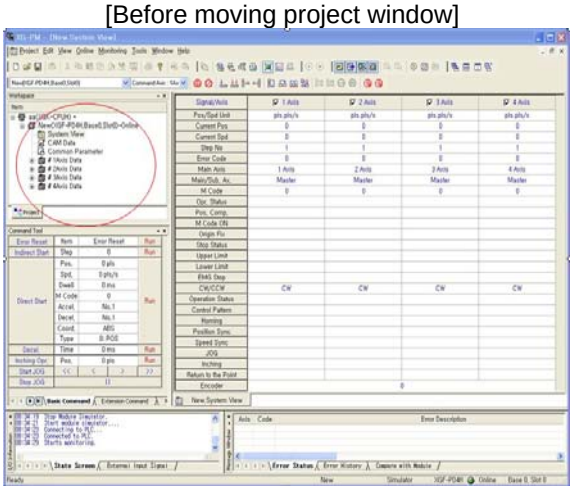
5.2.4 Conversion of Viewing Window

All of the windows which are saw in the viewing menu (project window, input/output information window, message window, etc) has docking function. Using mouse can change the window size. And can hide window.

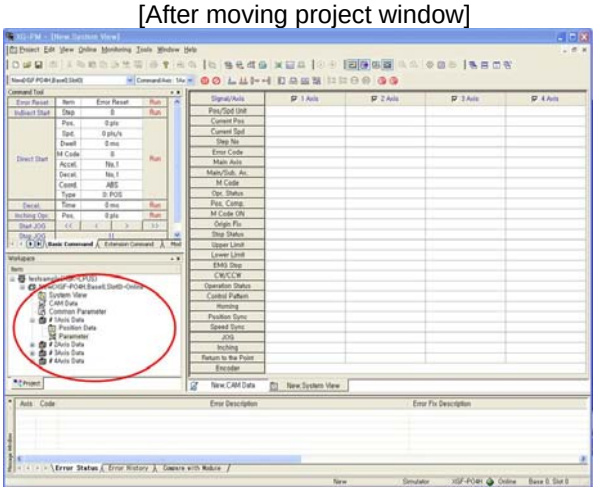
(1) **Moving location**

Use for left button of mouse drag to place where you need.
As shown below, before- and after-pictures of project windows moved downward

[Before moving project window]

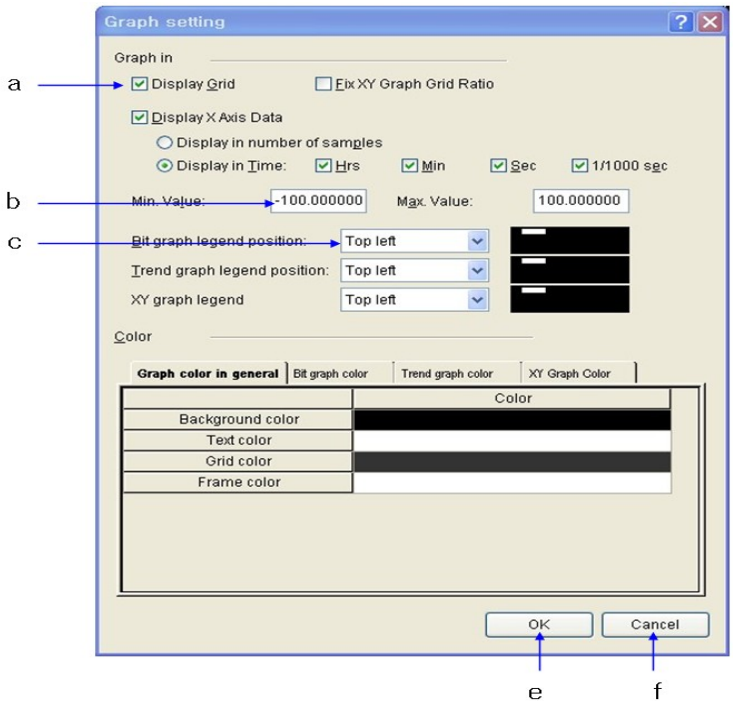


[After moving project window]



5.2.5 How to Use Communication Box

There are blank for input, confirm, selecting option, index, etc. User can setting figure what they want.



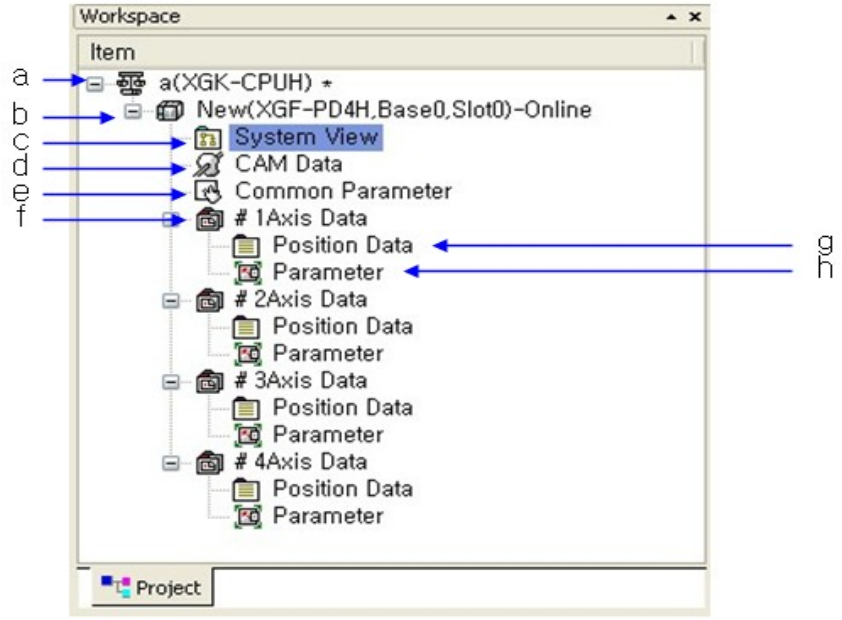
[Communication box description]

a) Option: You can use this when you check function check box (check box: can check more than 2 / radio box : check just one function.)
b) Input: Using the key can input word or figure.what you need.
c) Index: Select one from among them. Put the arrow key of index, can find and click what you want.
d) OK: Setting value will be apply with end of communication box.
e) Cancel: Cancel present setted value without changing.

Chapter 6 Drawing Up of Project

6.1 Composition of Project

Composition of project is as follows ;



No.	Item	Description
a	Project	It means whole system. That can include many positioning module of project.
b	Positioning module	It means the system which is one of the positioning module.
c	System view	Display windows which can display system condition of selected module.
d	CAM data	Define the setting cam data for creating cam profile that is using for cam operating.
e	Common parameter	It is common parameter which is applied to selected whole module.
f	Axis 1-4 data	Each axis data define to sub-item in axis 1-4.
g	Operating data	Define about operating data profile for positioning operation.
h	Operating parameter	Define setting parameter value for positioning operation.

Notes

Can include several modules to one project. In case of using several module with a project, management is easy.
And It can connect with several module for monitoring after operating just one XG-PM.\

6.2 Managing Project File

User using through various managing project function can composite and manage project more easy.

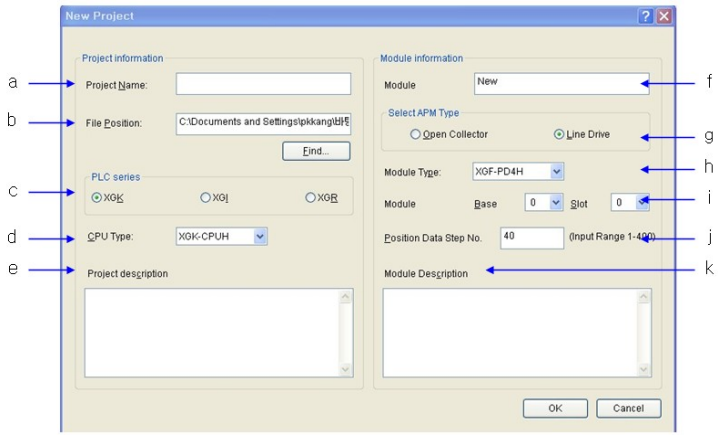
6.2.1 Make a New Project

When you make a project, new folder (The name of same with project file.) will be created. And also project file will be created in the sub-folder.

[Sequence]

1) Proceed this sequence; like this ; Menu [project]->[New project]
2) Input the project name.
3) Input the file position for saving project.
4) Select the PLC series.
5) Select the CPU type.
6) Input the project caption.
7) Input the module name.
8) Select the module type.
9) Select the module class.
10) Select location of module.
11) Input the number of operation data steps.
12) Input the module caption.
13) Click the confirm button.

[Communication box]



[Description of communication box]

a) Project name: Input the project name which user want. Inputted name will be project name. And file “Project name.xpj” will be created after creating project.
b) File position: Folder name will be made by inputted name by user. Then, project file will be created there.
c) PLC series: Setting PLC series.
d) CPU type: Setting CPU type of PLC.
e) Project description: Input project description.
f) Module information: Input the module name.
g) Select APM type: Setting positioning module type.
h) Module type: Set positioning module kind.
i) Module: Set position of positioning module.

j) Position data step No.: Set the number of operation data steps.
k) Finding: See existing folder and Set the position for saving project file.
l) Module description: Input module caption.

Notes

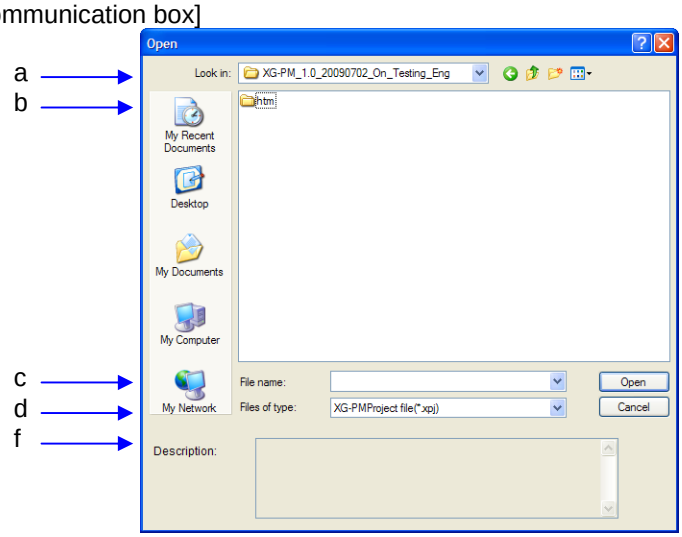
When you make a project, new folder (The name of same with project file.) will be created. And also project file will be created in the sub-folder. XG-PM project file extension is “xpj”, and It will proceed auto naming when makes project.

6.2.2 Open Project

Open existing project file.

[Sepuence]
1) Proceed this sequence; Menu [Project]->[Open project].
2) Adjust position which you want to find and select the project positioned folder.
3) Select and open the file that extension is“xpj”.

[Communication box]



[Description of communication box]
a) Position for finding: Search folder that project was saved by user.
b) Displaying windows for project file: Display the file that extension is“xpj”.
c) File name: Display project file name that is selected by user. And user can change file name what you want.
d) File type: Select the type of project file.
e) Caption: Display project caption that is saved in project file which is selected by user.

Notes

Can see description that was wrote by user when select project file. And this description will help what user select project.

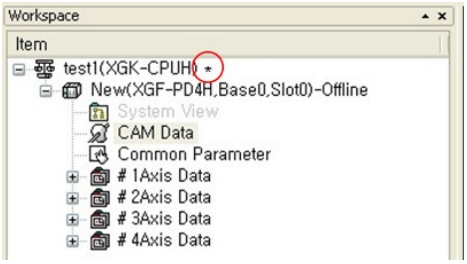
6.2.3 Saving Project

Save project file that is changed by user editing.

[Sequence]

1) Proceed this sequence; Menu [Project]->[Save project…].

Notes



In case that project need saving because project was edited. There are "*" next to name of project windows.

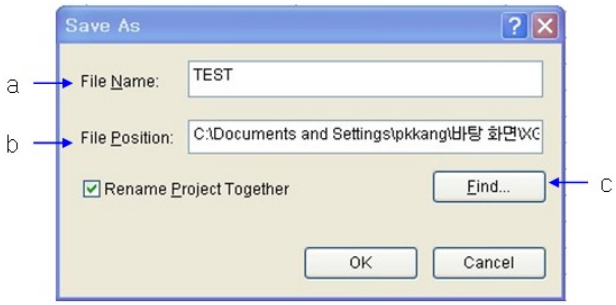
6.2.4 Saving as Other Name

Save the project as other file.

[Sequence]

1) Proceed this sequence ; Menu [Project]->[Save as…]
2) Click OK button.

[Communication box]



[Descript communication box]

a) File name : Input name that user want as project name.
b) File position : The project file will be created in the folder which is the name of same with project .
c) Find : Set position of project file. Then existing folder is a standard position.

6.3 Open APM File

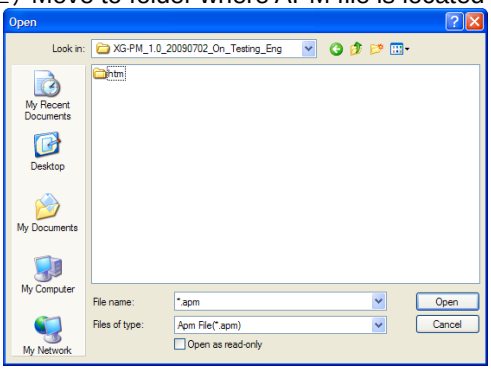
Read data file (*.apm) for APM software packaging and change to project file(*.xpj) in the menu of opening APM file . These are data index that are can call from APM file.

1. Common parameter
2. Operating parameter
3. Operating data

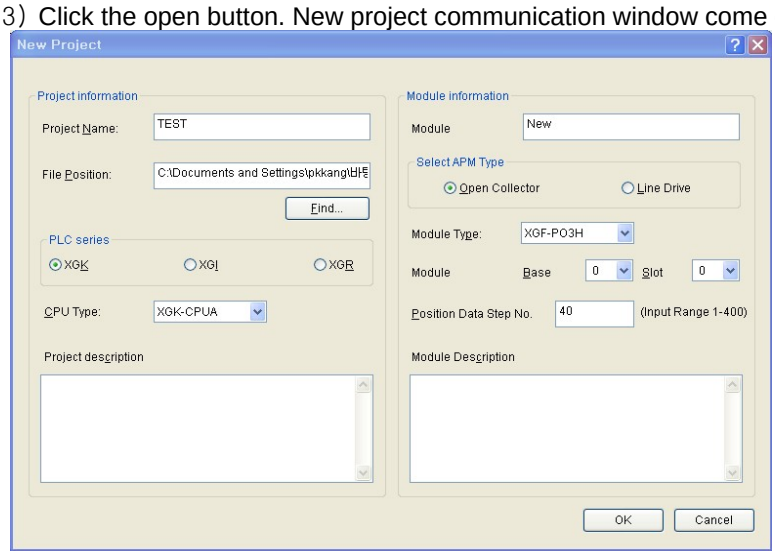
[Sequence]

1) Menu [Project]->[Open APM file]

2) Move to folder where APM file is located and select the file, when come out opening windows.



3) Click the open button. New project communication window come out.



4) Input the Project name, PLC type, module type and click the confirm button.
Then APM file will change to XG-PM project, and create project.

Notes

Not only read "*.apm" file and create project of module but also appointing new module type can help creating project. But if there is no data in APM file, it will be initialized.
Ex) XGF-PO3A -> XGF-PO4H

6.4 Project Item

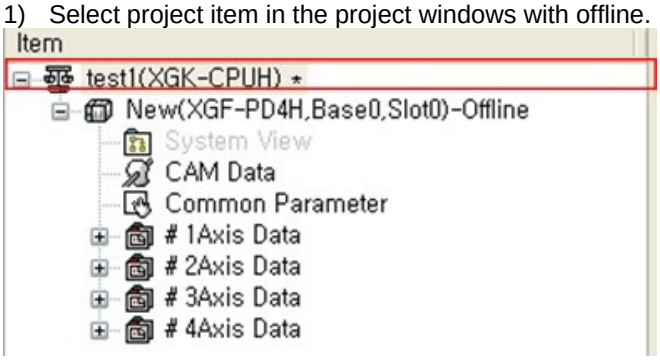
Here describes how to add or delete project file, how to confirm information of each item.

6.4.1 Add Item

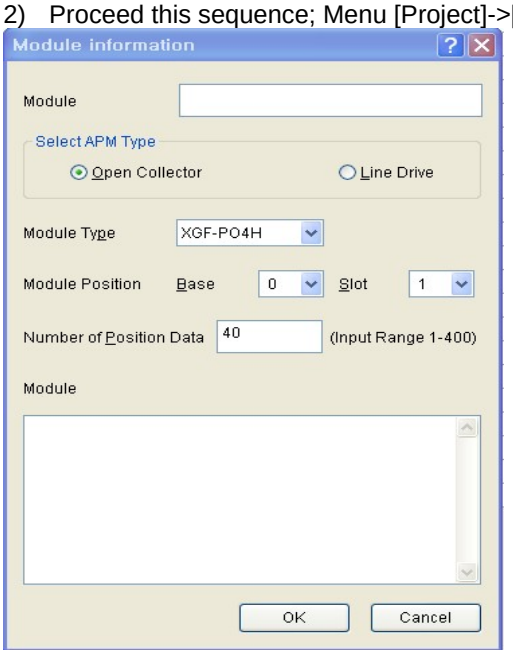
Add module to project.

[Sequence]

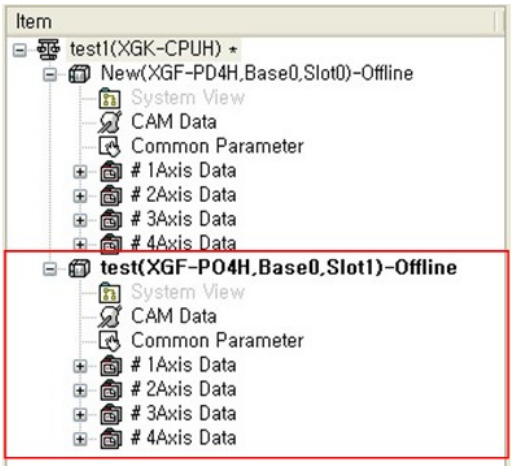
1) Select project item in the project windows with offline.



2) Proceed this sequence; Menu [Project]->[Add item]->[Module]



3) Click the confirm button after input module name, module type, which kind of module, module position, the number of operating data steps, module caption. Will be add new module in the project.



6.4.2 Read Item From File

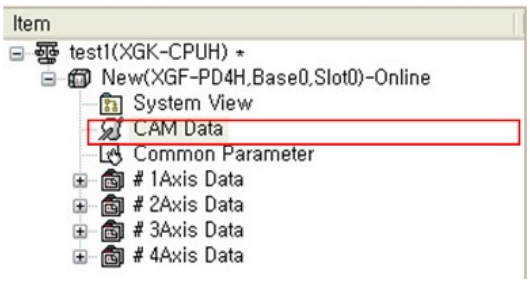
These items can be read as other files.

Item	File extension	Description
Cam setting data	*.caf	Read setted data from that file for creating cam profile.
Common parameter	*.cp	Read data of common parameter from that file.
Operating data	*.rpd	Read profile data from that file.
Operating parameter	*.bp	Read operating parameter from that file.
Module data	*.pm	Read module data from that file.

(1) Cam Setting Data

[Sequence]

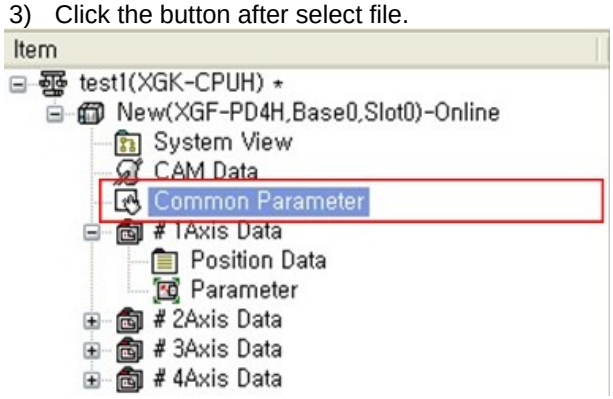
1) Select cam data item from project windows.
2) Proceed this sequence; Menu [Project]->[Import]->[Cam setting data]
3) Click the button after select file.



(2) Common Parameter

[Sequence]

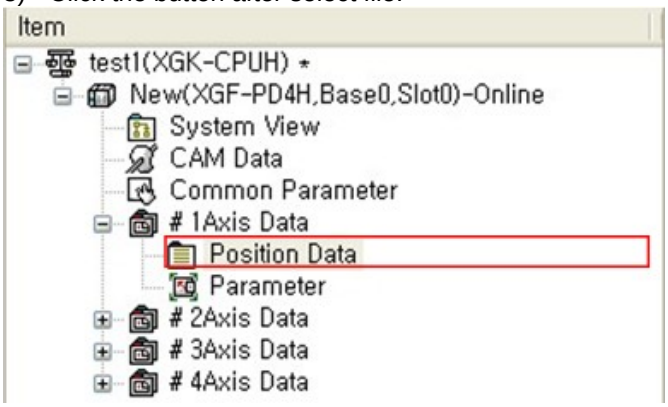
1) Select common parameter from project windows.
2) Proceed this sequence ; Menu[Project]->[Import]->[Common parameter..]
3) Click the button after select file.



(3) Operation Data

[Sequence]

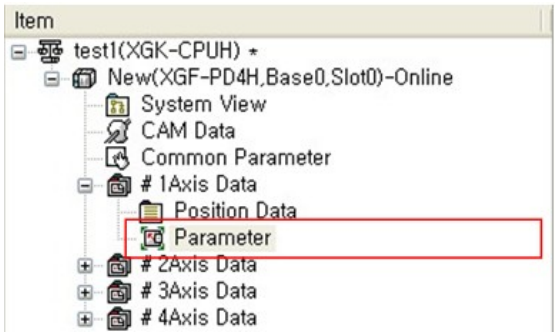
1) Select common parameter from project windows.
2) Proceed this sequence ; Menu [Project]->[Import]->[Position data]
3) Click the button after select file.



(4) Operation Parameter

[Sequence]

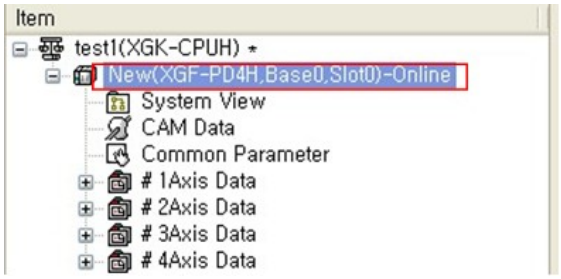
1) Select common parameter from project windows.
2) Proceed this sequence ; Menu[Project]->[Import]->[Parameter]
3) Click the button after select file.



(5) Module Data

[Sequence]

1) Select module from project windows.
2) Proceed this sequence ; Menu[Project]->[Import]->[Module data]
3) Click the button after select file.



6.4.3 Saving Item as File

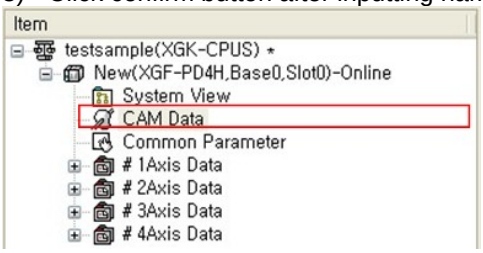
These items can be saved as other files.

Item	File extension	설명
Cam setting data	*.caf	Save the setted data for creating cam profile.
Cam profile data	*.csv	Save cam profile created data as “csv” file type.
Common parameter	*.cp	Save common parameter.
Operation data	*.rpd	Save profile data for operating.
Operation parameter	*.bp	Save operation paramete that need to operate.
Module data	*.pm	Save module data as file.

(1) Cam Setting Data

[Sequence]

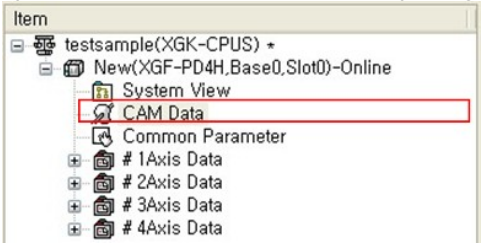
1) Select cam data item in the project windows.
2) Proceed this sequence; Menu [Project]->[Save item as project]->[setted files].
3) Click confirm button after inputting name.



(2) Cam Profile Data

[Sequence]

1) Select cam data item in the project windows.
2) Proceed this sequence; Menu [Project]->[Save item as file]->[CSV file].
3) Click the confirm button after inputting file name.



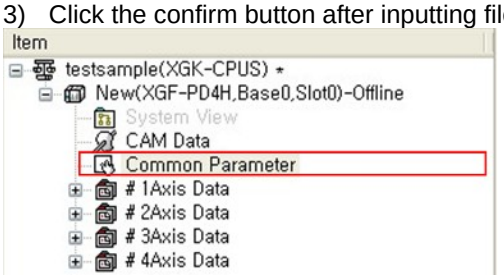
Notes

Cam profile data only after setting cam setting data in the cam data item and creating profile can save as item.
(Please refer to 8.6. setting electric cam on this manual.)

(3) Common Parameter

[Sequence]

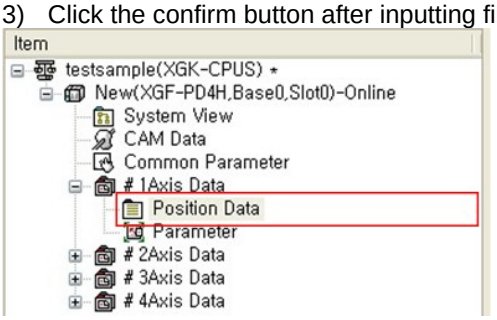
1) Select common parameter from project windows.
2) Proceed this sequence; Menu [Project]->[Save as project]->[Setting file].
3) Click the confirm button after inputting file name.



(4) Operation Data

[Sequence]

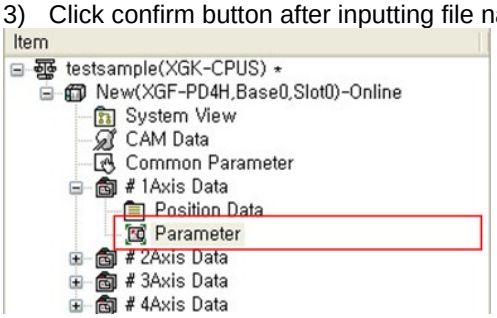
1) Select operation data from project windows.
2) Proceed this sequence ; Menu[Project]->[Save as project]->[Setting file].
3) Click the confirm button after inputting file name.



(5) Operating Parameter

[Sequence]

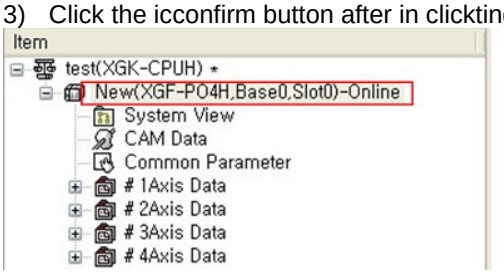
1) Select operation parameter in the project windows.
2) Proceed this sequence; Menu [Project]->[Save as project]->[setting file].
3) Click confirm button after inputting file name.



(6) Module Data

[Sequence]

1) Select module in project windows.
2) Proceed this sequence ; Menu [Project]->[Save as project]->[Module data]
3) Click the icconfirm button after in clickting file name.



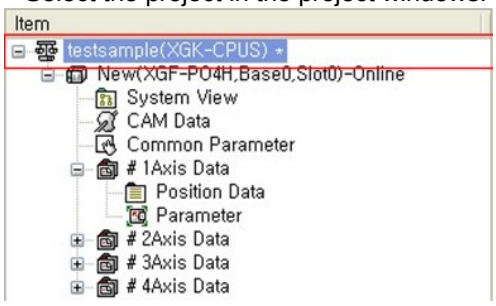
6.4.4 Item Registration Information

Can confirm and change registration information of each items.

(1) Project Registration Information

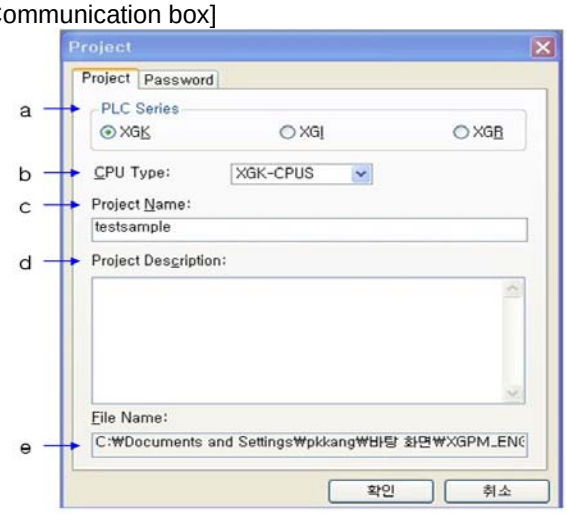
[Sequence]

1) Select the project in the project windows.



2) Proceed this sequence ; Menu [view]->[Properties…].
3) Click the confirm button after fixing.

[Communication box]



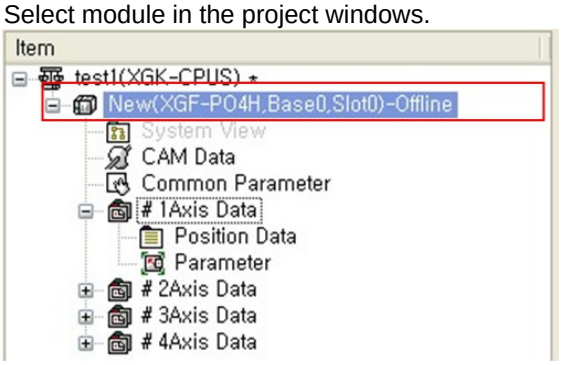
[Descripting communication box]

a) PLC series: Display PLC series. Can do editing.
b) CPU type: Display CPU type. Can do editing.
c) Project name: Display project name. Can do editing.
d) Project description: Display project caption. Can do editing.
e) File name: It will show you file route which is saved and file name. But, File name can not edit, And should use this menu ([project]->[Save as..]) for saving as other file name.

(2) Module Registration Information

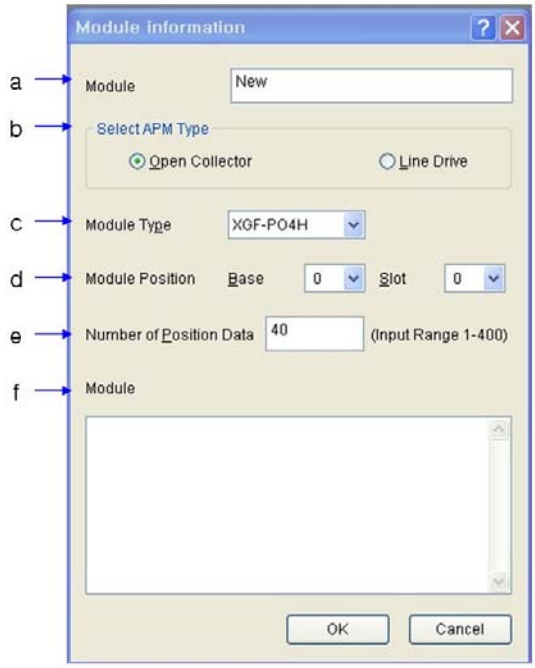
[Sequence]

1) Select module in the project windows.



2) Proceed this sequence ; menu[view]->[Properties…].

[Communication box]



3) Click the OK button after modification.

[Description about Communication box]

a) Module name: Display module name. Can do editing.
b) Select positioning type: Select positioning type and can do editing.
c) A kind of Module: Display a kind of module which is selected. Can do editing.
d) Module position: Display module position which is selected. Can do editing.
e) Number of position data: Display selected the number of operation data steps that can be edited. Can do editing.
f) Module : Display module caption of selected module. Can do editing.

Notes

Each item and registration information of module can not edit when it is on-line.

6.5 Project Password

It is possible that it set password with project file for safety. And this password has no relationship with PLC password.

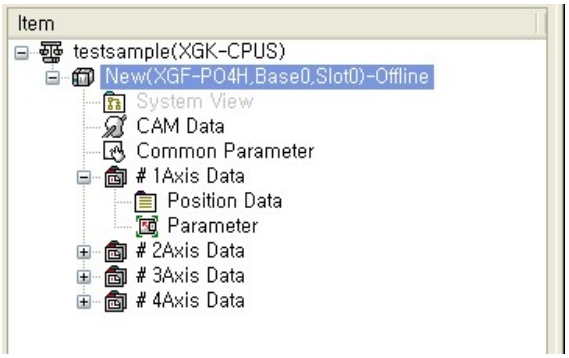
Notes

1. Keyboard key can not understanding difference of Korean/English key and just can understand difference of big letters and small letters for password. It has 8 maximum key spaces for inputting password.
2. Please be careful, If you forget the password, can not open the project file.

6.5.1 Setting Password

[Sequence]

1) Select the project in the project windows.



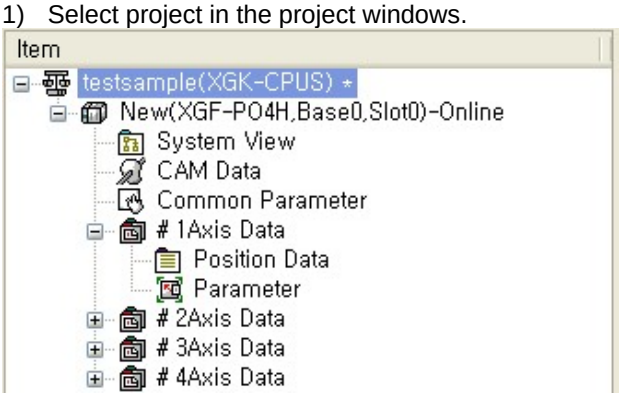
2) Proceed this sequence ; Menu [View]->[Registration information].
3) Select tab of password in the project communication box.

4) Input the password to blank of new password.
5) Retry to input same password to blank of confirm password.
   (Then, Password should same with 4))
6) Click the confirm button.

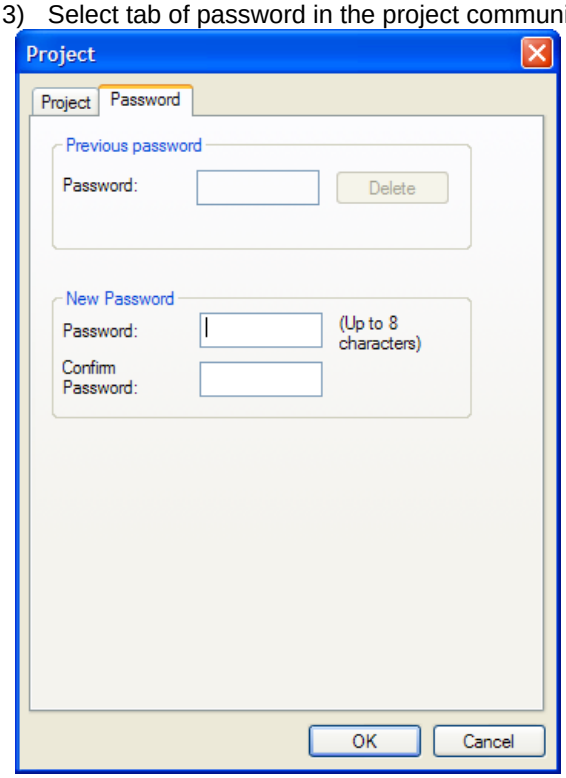
6.5.2 Password Modification

[Sequence]

1) Select project in the project windows.



2) Proceed this sequence; Menu [View]->[Properties…].
3) Select tab of password in the project communication box.

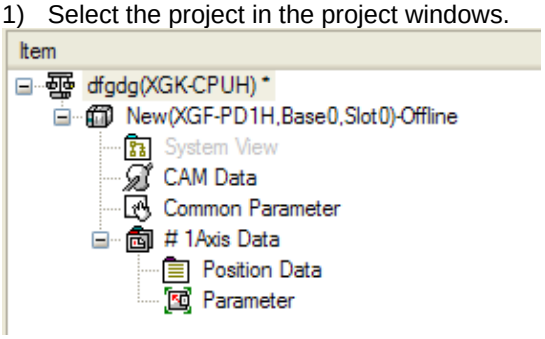


4) Input the old password in the blank of before password.
5) Input new password in the blank of new password.
6) Retry to input same password to blank of confirm password.
(Then, Password should same with 5)
7) Click the confirm button.

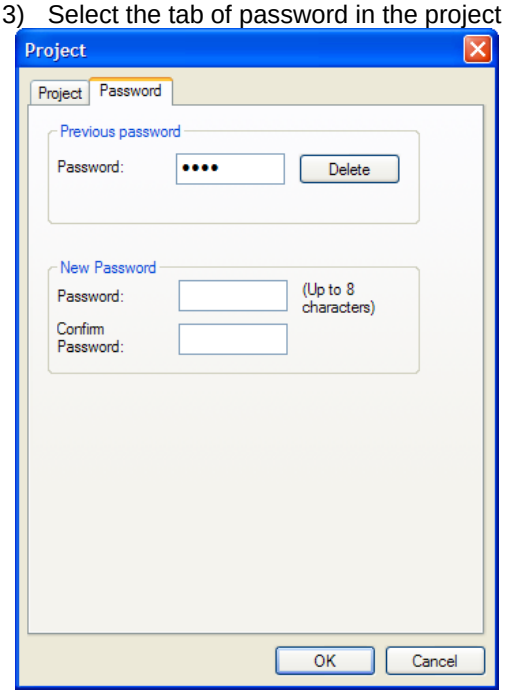
6.5.3 Delete password

[Sequence]

1) Select the project in the project windows.



2) Proceed this sequence; Menu [View]->[Properties…].
3) Select the tab of password in the project communication box.



4) Input the old password in the blank of before password.
5) Click the delete button.

Chapter 7 Check System

Assign the module for connect with setted module in the project. And check the initial operation.

7.1 Connect PLC

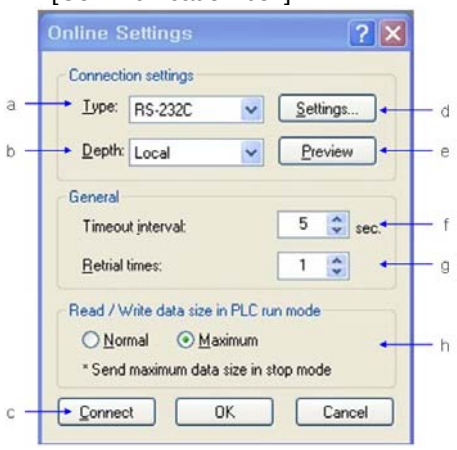
7.1.1 Setting Local Connection

Setting local connection can connect with RS-232C or USB.

[Sequence]

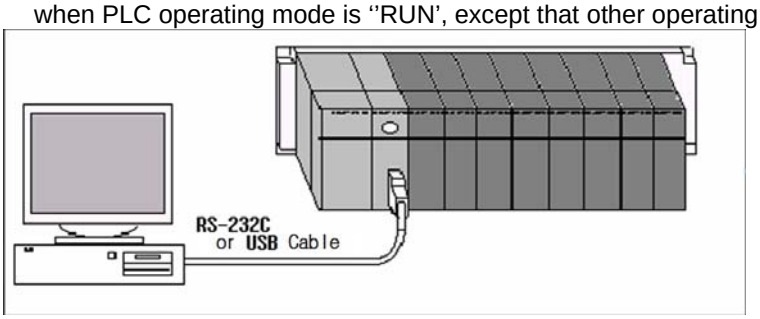
1) Menu [Online]->[Connection setting].

[Communication box]



[Descript communication box]

a) Type : This is setting communication media when it connect with PLC. Can set by RS-232C, USB, Ethernet, Model.
b) Depth : Set connection structure with PLC. Can set Local, remote level 1, remote level 2.
c) Connect : Try to connect with PLC by setted connection option.
d) Settings : Can set by the way of connection which is selected a.
e) Preview : Can confirm at a glance. About whole connection option.
f) Timeout interval : In case that can not connect with PLC within the setted time, can retry to connect by time-out.
g) Retrial times : . In case that failed connection with PLC, decide how many times to retry connection.
h) Read/Write data size in PLC run mode; Set size of data transmission frame. This option only is applied when PLC operating mode is ‘’RUN’, except that other operating mode send Maximum frame size.

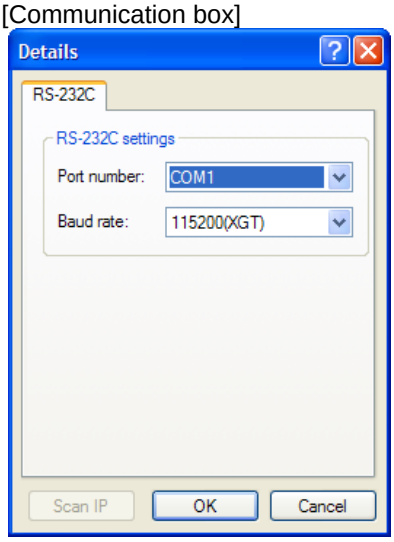


(1) Local RS-232C Connection

[Sequence]

1) Select RS-232C in the way of connection.
2) Put the 'Settings' button and set communication speed, communication COM port.
3) Put the confirm button and save communication option.

[Communication box]



Notes

1. Basic setting is setted by RS-232C, COM1 and communication speed is 115200 bps.
2. Transmission speed suppoer 38400 bps and 115200 bps.
3. Transmission speed of XGK series is 115200 bps. In case of connecting remote (using by Rnet), transmission speed is 38400 bps.
4. Transmission port can set from COM1 to COM8.
5. When user use 'USB to Serial' device, should use virtual COM port as communication port. If you need confirm setted port No.,please confirm device manager.
6. XG-PM, XG-PD, Device monitor, system monitor can connect with just one PLC at the same time in XG5000. But, connection option have to consensus with others.

(2) Local Connecting USB

[Sequence]

1. Select 'USB' for communication method.
2. USB has no detail setting option. Therefore, setting button will be deactivated.
3. Put the confirm button and save connection option.

Notes

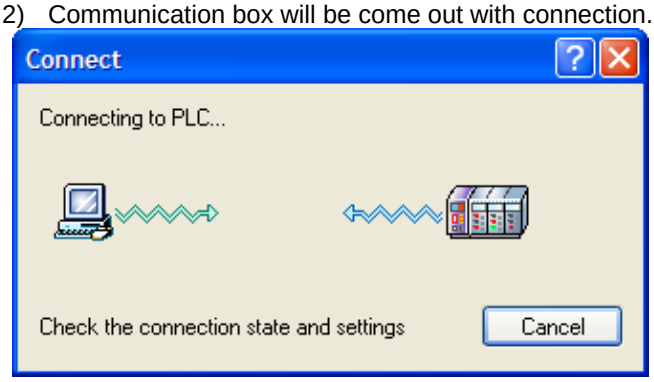
1. If user want to connect with PLC by USB, user need to install USB device driver.
2. When user install XG5000, USB driver will be auto-download and install. If USB driver installation is not normal, please download Driver from home page of LS industrial system.

7.1.2 Module Connection & Confirm connection

Try to connect with PLC by setted option.

[Sequence]

1) Select Menu [Online]->[Connect].
2) Communication box will be come out with connection.

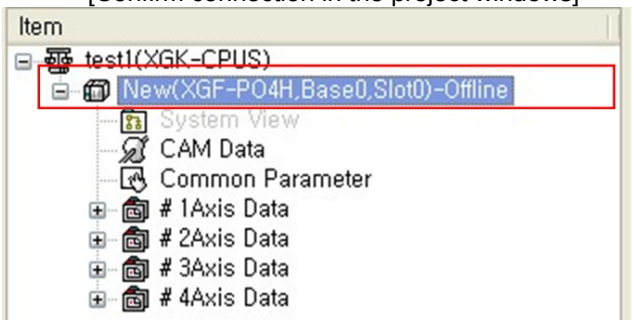


3) Display On-line menu and condition with connecting PLC.

Notes

1. Communication box rapidly will be come out and gone, when it success connecting with PLC.
2. Module connection condition will be display by the side of project name and status bar after connecting with PLC.

[Confirm connection in the project windows]



[Confirm connection in the project windows]

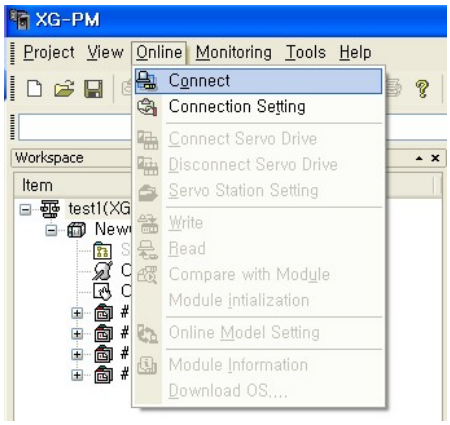
3. After connecting PLC, In case of connecting with other type PLC, connecting PLC automatically be disconnected.
4. Monitoring will be end when it perform disconnection.

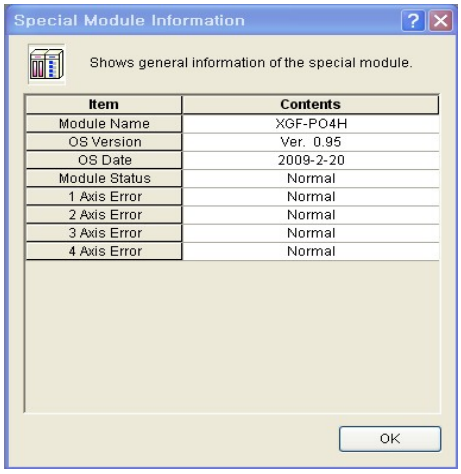
7.2 Confirm Module O/S Information

Can confirm module O/S information at the system view.
Display version information with product of the day.

[Sequence]

1) Select this sequence; Menu [Online]->[Connect] ; Connecting PLC (Module).
2) Select this sequence; Menu [Online]->[Module information].
3) Confirm O/S information in the module information windows.





Notes

Display O/S version information only when module installed in that position.

Chapter 8 Setting Data

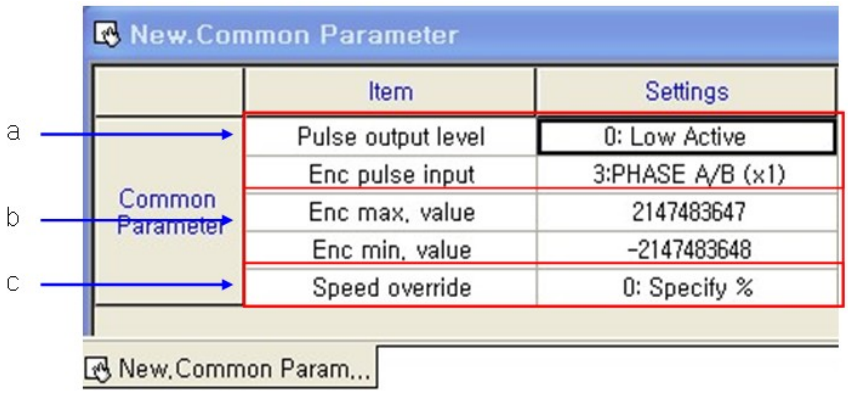
Here describes setting data of positioning module.

8.1 Setting Common Parameter

[Sequence]

1) Double-click [Common parameter] in the project tree.
2) Cick the cell which you want to set and input data.

[Setting screen]



[Setting screen description]

a) Encoder input mode and setting pulse output level.
b) Setting encoder input range.
c) Setting speed override unit.(Designate % or Can designate speed input value.)

8.2 Setting Operation parameter

[Sequence]

1) Double-click [Axis 1~4 data]->[Parameter] in the project tree.
2) Click cell which you want to set and input data.

[Setting screen]

	Item	1 Axis	2 Axis	3 Axis	4 Axis
Basic Parameter	Unit	pulse	pulse	pulse	pulse
	Pulses per rotation	20000 pls	20000 pls	20000 pls	20000 pls
	Travel per rotation	20000 pls	20000 pls	20000 pls	20000 pls
	Unit multiplier	0: x1	0: x1	0: x1	0: x1
	Speed command unit	0: Unit/Time	0: Unit/Time	0: Unit/Time	0: Unit/Time
	Pulse output mode	0: CW/CCW	0: CW/CCW	0: CW/CCW	0: CW/CCW
	Bias speed	1 pls/s	1 pls/s	1 pls/s	1 pls/s
	Speed limit	100000 pls/s	100000 pls/s	100000 pls/s	100000 pls/s
	Acc. time1	500 ms	500 ms	500 ms	500 ms
	Acc. time2	1000 ms	1000 ms	1000 ms	1000 ms
	Acc. time3	1500 ms	1500 ms	1500 ms	1500 ms
	Acc. time4	2000 ms	2000 ms	2000 ms	2000 ms
	Dec. time 1	500 ms	500 ms	500 ms	500 ms
	Dec. time 2	1000 ms	1000 ms	1000 ms	1000 ms
	Dec. time 3	1500 ms	1500 ms	1500 ms	1500 ms
	Dec. time 4	2000 ms	2000 ms	2000 ms	2000 ms
	Dec. time for emg. stop	0 ms	0 ms	0 ms	0 ms
Extended Parameter	S/W upper limit	2147483647 pls	2147483647 pls	2147483647 pls	2147483647 pls
	S/W lower limit	-2147483648 pls	-2147483648 pls	-2147483648 pls	-2147483648 pls
	Backlash compensation	0 pls	0 pls	0 pls	0 pls
	Position completion time	1000 ms	1000 ms	1000 ms	1000 ms
	S-Curve ratio	50 %	50 %	50 %	50 %
	Acc./Dec. pattern	0: Trapezoid	0: Trapezoid	0: Trapezoid	0: Trapezoid
	M code mode	0: None	0: None	0: None	0: None
	Software limit detect	0: Don't detect	0: Don't detect	0: Don't detect	0: Don't detect
	External VTP	0: Disable	0: Disable	0: Disable	0: Disable
	External stop selection	0: EMG stop	0: EMG stop	0: EMG stop	0: EMG stop
	Position complete condition	0: Dwell	0: Dwell	0: Dwell	0: Dwell
	Int. continuous opr. type	0: Pass target pos.	0: Pass target pos.	0: Pass target pos.	0: Pass target pos.
	Arc insertion position	0 pls	0 pls	0 pls	0 pls
	Arc insertion	0: Don't insert	0: Don't insert	0: Don't insert	0: Don't insert
	Spd. override with pos. coordi.	0: ABS	0: ABS	0: ABS	0: ABS
Manual Operation Parameter	JOG high speed	5000 pls/s	5000 pls/s	5000 pls/s	5000 pls/s
	JOG low speed	1000 pls/s	1000 pls/s	1000 pls/s	1000 pls/s
	JOG acceleration time	1000 ms	1000 ms	1000 ms	1000 ms
	JOG deceleration time	1000 ms	1000 ms	1000 ms	1000 ms
	Inching speed	100 pls/s	100 pls/s	100 pls/s	100 pls/s
Homing Parameter	Home position	0 pls	0 pls	0 pls	0 pls
	Home high speed	5000 pls/s	5000 pls/s	5000 pls/s	5000 pls/s
	Home low speed	500 pls/s	500 pls/s	500 pls/s	500 pls/s
	Home acc. time	1000 ms	1000 ms	1000 ms	1000 ms
	Home dec. time	1000 ms	1000 ms	1000 ms	1000 ms
	Home dwell time	0 ms	0 ms	0 ms	0 ms
	Home compensation	0 pls	0 pls	0 pls	0 pls
	Home restart time	0 ms	0 ms	0 ms	0 ms
	Home method	0: DOG/Home(OFF)	0: DOG/Home(OFF)	0: DOG/Home(OFF)	0: DOG/Home(OFF)
	Home direction	1: CCW	1: CCW	1: CCW	1: CCW
I/O Signal Parameter	Upper limit signal	N.Open	N.Open	N.Open	N.Open
	Lower limit signal	N.Open	N.Open	N.Open	N.Open
	DOG signal	N.Open	N.Open	N.Open	N.Open
	Home signal	N.Open	N.Open	N.Open	N.Open
	EMG signal	N.Open	N.Open	N.Open	N.Open
	VTP Signal	N.Open	N.Open	N.Open	N.Open
	Driver ready signal	N.Open	N.Open	N.Open	N.Open
	Inposition signal	N.Open	N.Open	N.Open	N.Open
	Deviation cnt. clear output	N.Open	N.Open	N.Open	N.Open

a → Basic Parameter
b → Extended Parameter
c → Manual Operation Parameter
d → Homing Parameter
e → I/O Signal Parameter

[Setting screen description]

a) Basic parameter : Set basic parameter for operating.
b) Extended parameter : Set expansion parameter.
c) Manual operation parameter: Set parameter for manual operation.
d) Homing parameter: Set parameter when it is homing.
e) I/O signal parameter: Set contact type of external signal (contact A or contact B).

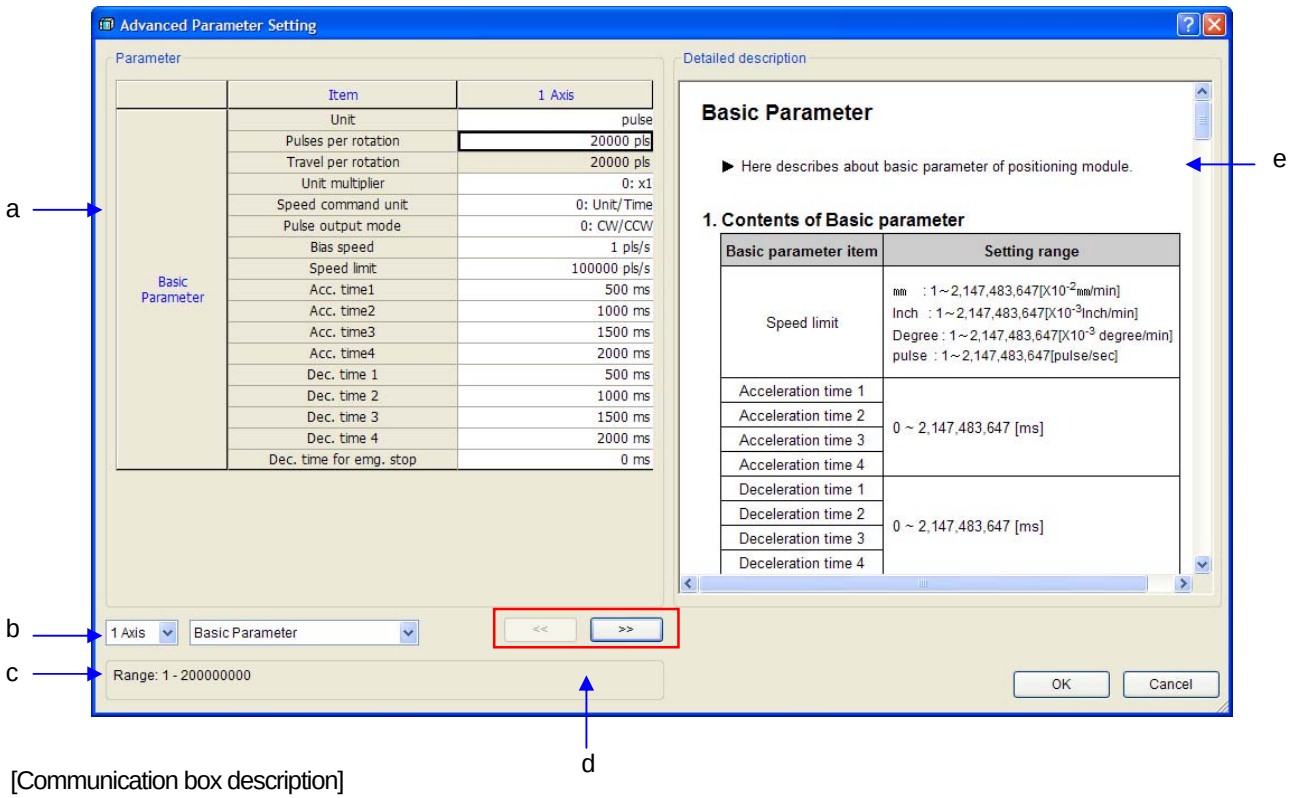
8.2.1 Setting detailed parameter

XG-PM provides setting parameter function for convenient setting operation parameter. User can set operation parameter by help of each parameter.

[Sequence]

1) Double-Click; [# Axis 1~4 data]->[parameter] in the project tree.
2) Progress this sequence; Menu [Edit]->[Detail parameter setting].
3) Set parameter in the communication box of setting detail parameter.

[Communication box]



[Communication box description]

a) Parameter : Display parameter Display parameter according to each group. Select each cell and set parameter.
b) Axis & Parameter move to between groups : Provide item list for convenient moving between groups. Then, detailed screen also will be new according to moving between groups.
c) Display data range : Set range of selected parameter data.
d) Moving group button: Set that was displayed moving between groups of parameter screen. Then, detailed screen also will be new according to moving between groups.
e) Detail description : Provides help about each item of set parameter.

Notes

Application of editing data : Set detail parameter data, only put the [Confirm] button of communication box, can apply editing data. Put the [cancel] button, will not be applied set data.

8.2.2 Detail View/Simple View

Use menu (positioned on the top of the operation parameter screen) and provides function (detail view /simple view).
If user want more detail, Select [detail view] and set parameter.

[Sequence]

1) Revitalize operation parameter screen.
2) Click [Item] on the upper end.
3) When user clicks [item], dropdown menu will be come out. And User can select detail view /simple view.
4) Select menu (detail view /simple view) and perform.

[Setting screen]

a →

	Item	1 Axis	2 Axis
	Detail View Shift+D / Simple View Shift+S	pulse	pulse
		20000 pls	20000 pls
Basic Parameter	Travel per rotation	20000 pls	20000 pls
	Unit multiplier	0: x1	0: x1
	Speed command unit	0: Unit/Time	0: Unit/Time
	Pulse output mode	0: CW/CCW	0: CW/CCW
	Bias speed	1 pls/s	1 pls/s
	Speed limit	100000 pls/s	100000 pls/s
	Acc. time1	500 ms	500 ms
	Acc. time2	1000 ms	1000 ms
	Acc. time3	1500 ms	1500 ms
	Acc. time4	2000 ms	2000 ms
	Dec. time 1	500 ms	500 ms
	Dec. time 2	1000 ms	1000 ms
	Dec. time 3	1500 ms	1500 ms
	Dec. time 4	2000 ms	2000 ms
	Dec. time for emg. stop	0 ms	0 ms
Extended Parameter	S/W upper limit	2147483647 pls	2147483647 pls
	S/W lower limit	-2147483648 pls	-2147483648 pls
	Backlash compensation	0 pls	0 pls
	Position completion time	1000 ms	1000 ms
	S-Curve ratio	50 %	50 %
	Acc./Dec. pattern	0: Trapezoid	0: Trapezoid
	M code mode	0: None	0: None
	Software limit detect	0: Don't detect	0: Don't detect
	External VTP	0: Disable	0: Disable
	External stop selection	0: EMG stop	0: EMG stop
	Position complete condition	0: Dwell	0: Dwell
	Int. continuous opr. type	0: Pass target pos.	0: Pass target pos.
	Arc insertion position	0 pls	0 pls
	Arc insertion	0: Don't insert	0: Don't insert
	Spd. override with pos. coordi.	0: ABS	0: ABS

[Setting screen description]

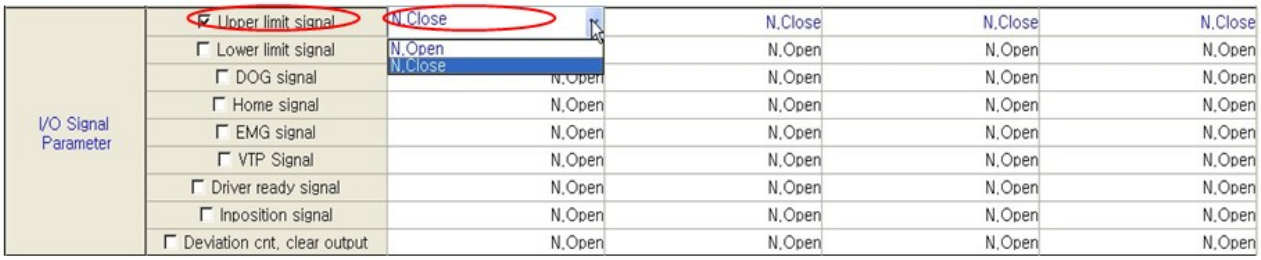
Detail view /Simple view :

a) Detail view; Display all parameter on the screen.
Simple view; Display parameter which is necessary parameter for operating.

8.2.3 Setting Input/Output signal parameter

Provides function (Setting input/output signal parameter at a time.) for convenient (setting easily parameter of input/output signal).
In case that check input/output signal parameter,
When user checks input/output signal parameter, it can be set parameter several of axis at a time. If user didn't check the check box, it can be set only one.

[Setting screen]



8.3 Setting operation data

[Sequence]

1) Double-click [Axis #1~4 data]->[operation data].
2) Input data after selecting cell which you want to set.

[Setting screen]

a →
b →

1 Axis	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]	Sub. axis setting	Cir. int. auxiliary point	Cir. int. mode	Circular int. turns	Helical int.
1	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
2	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
3	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
4	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
5	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
6	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
7	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
8	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
9	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
10	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
11	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
12	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
13	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
14	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
15	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
16	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
17	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
18	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
19	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
20	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
21	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
22	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
23	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
24	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
25	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
26	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
27	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
28	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
29	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
30	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
31	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
32	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
33	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
34	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
35	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
36	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
37	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
38	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
39	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
40	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use

[Setting screen description]

a) Display axis : Show you axis that it is setting.
b) Display step : Display the number of operation steps.

8.3.1 View in detail/shortly

It provides function (detail view/simple view) by menu where it is positioned at the top of operation screen. If user set only elementary factor of operation data by function (detail view/ simple view), user can select simple view for setting operation data. If user wants for more detail setting, user can select detail view for setting operation data.

[Sequence]

1) Revitalize operation data screen.
2) Click [#1~axis4] of the top of screen.
3) When click [#1~axis4], drop down menu will be appeared and can see menu(detail view/simply view).
4) Select detail view or simply view and execute.

[Setting screen]

a →

1 Axis	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.
	Detail View Shift+D	NG, END	0	0	No.1	No.1
	Simple View Shift+S	NG, END	0	0	No.1	No.1
	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1
4	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1
5	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1
6	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1
7	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1
8	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1
9	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1
10	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1

[Description of setting screen]

a) Detail view/Simple view : Detail view display editing item of whole operation data. Simple view display elementary item of the operation data.

Notes

This is the displayed item of operation data at the screen when select detail view menu.

1 Axis	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]	Sub. axis setting	Cir. int. auxiliary point	Cir. int. mode	Circular int. turns	Helical int.
1	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use

This is the displayed item of operation data at the screen when select simply view menu.

1 Axis	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0

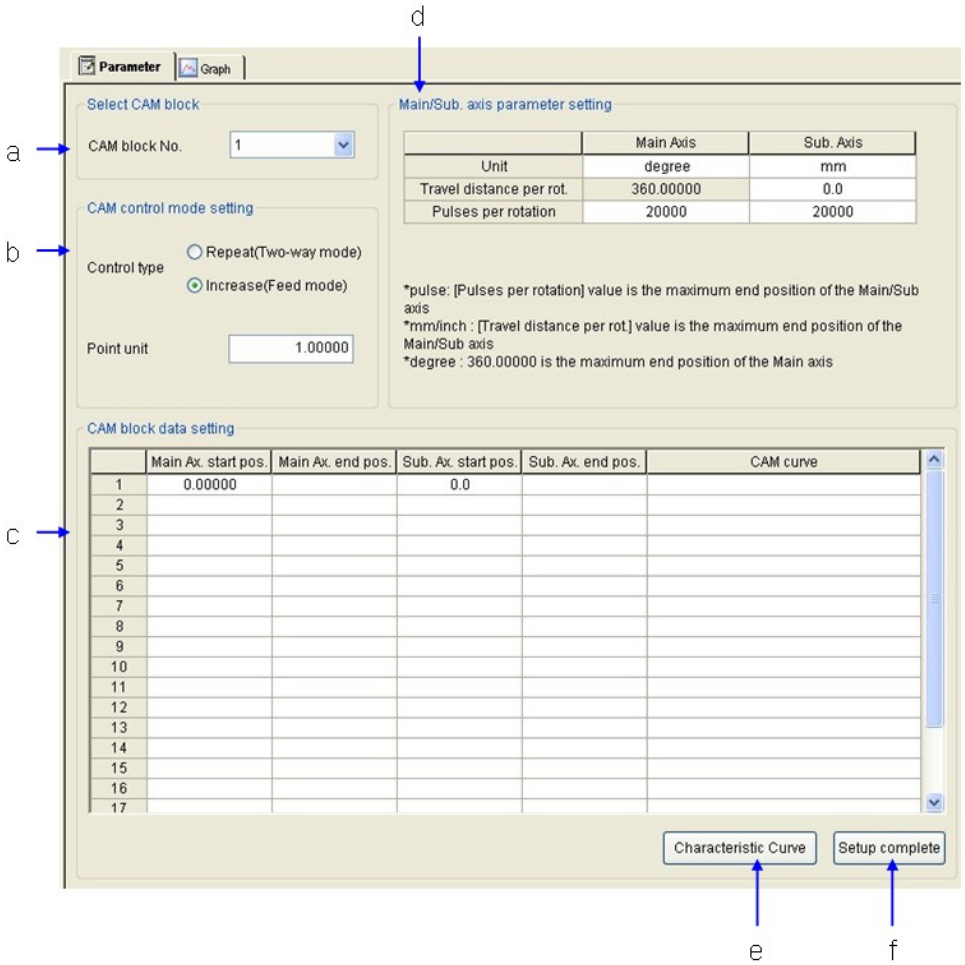
8.4 Setting Electronic CAM

XG-PM provides function of creating profile for operating electronic CAM.

[Sequence]

1) Double click [CAM data] on the project tree.
2) Setting CAM block number what you want.
3) Setting CAM control mode. Then setting unit of point.
4) Set the principal axis/the sub axis. Set CAM block data depends on this standard.
5) Set CAM block data.

[Setting screen]



[Description of setting screen]

a) Select CAM block : Setting CAM data block what you need to set. CAM data block can be set from no.1 to no.8.
b) Setting CAM control mode : Set control method & point unit of CAM data. Select repeat mode of control method when creating profile. (But, not increase direction and when create repeated profile).
Select increasing mode when creating CAM profile which is increased to one-way.
c) Setting the principal axis/the sub axis parameter: Set the data for positioning several *axis with CAM operation.
Then, the data which is meaning last position of the *axis is as follow. And the axis position is depends on setting unit of *axis.
(*axis: the principal axis/ the sub axis)

In case that pulse is unit of axis (the principal axis/ the sub axis)**:** [the number of pulses per rotation] The value to be maximum last position of axis (principal axis/the sub axis)

In case that mm/inch is unit of axis (the principal axis/ the sub axis): [travel distance per rotation] The value to be maximum last position of axis (principal axis/the sub axis)

In case that degree is unit of the principal axis: 360.00000 is the maximum last position of the principal axis. (The sub axis has not unit degree)

d) Setting CAM block data : Set CAM block data depends on setting CAM control mode and the principal axis/ the axis of ordinates of parameter.

Start position of the principal axis: Set the position which main axis is began on the current step. When set main ax. end position, next main ax. start position also to be set automatically.
But, if the last position of main axis is set, start position of main axis not to be set automatically.
Last position of main axis : Set the last position for movement of main axis. Set to maximum last position of main axis.
Start position of sub axis: Set the position which the sub axis is begun on the current step.
When set sub ax. end position, next sub ax. start position also to be set.
But, if the last position of the sub axis is set to maximum position, start position of the sub axis not to be set automatically.
Last position of the sub axis: Set the last position for movement of the sub axis. Set the last position for movement of the sub axis on the current step. Can set it to the last position of the sub axis.
CAM curve: Set the type of CAM curve for application on the current step. XG-PM support total 22 type of CAM curve.

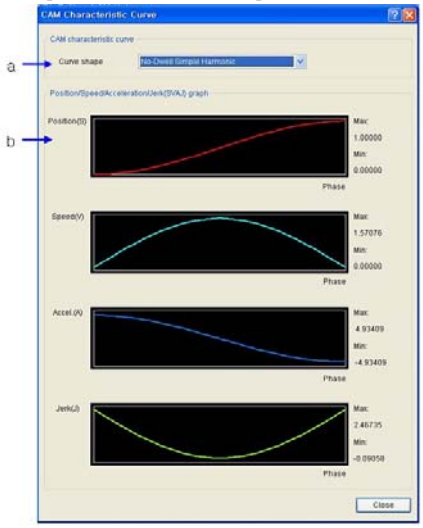
f) Special character curve button: Special character curve communication box to be revitalization when put this button.

g) Setting complete button: Create profile as set CAM block data up to now.

.

8.4.1 Confirm of CAM special character curve

Can set XG-PM after confirm CAM special character curve before set electronic CAM operation.
[Communication box]



[Communication box description]

a) CAM characteristic curve: Select type of CAM curve what you need to confirm. Support total 22 type of curve.

b) Position/Speed/Acceleration/Jerk (SVAJ) graph: Display characteristic curve of position/Speed/Acceleration/Jerk of selected CAM curve by each graph. And then in case of setting maximum value as “1”, can confirm value of maximum/minimum.

8.4.2 Confirm CAM graph

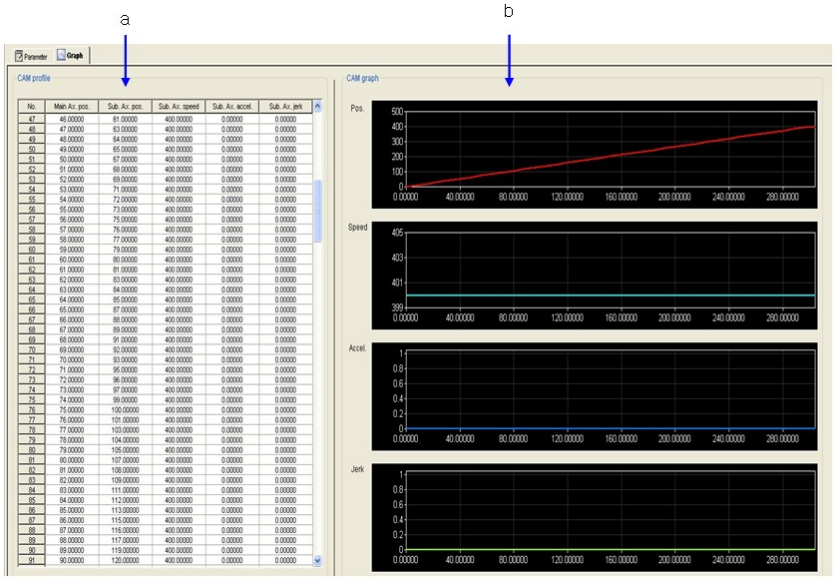
User can confirm CAM profile by CAM parameter which is set by user on the graph screen of CAM data screen
It is possible that user confirm CAM profile which is made by CAM parameter as data value on the graph and each point.

[Sequence]

1) Revitalize CAM data screen.
2) Set CAM data on the parameter screen. (refer to this manual 8.6)
3) Put the setting complete button.
4) Put setting complete button, automatically change to graph screen with this picture.
(But, this picture will be disappeared automatically.

5) Confirm Cam profile which is set by user of CAM block.

[Graph tab screen]



[Graph tab screen description]

a) CAM profile: Display created result data after setting CAM profile. Display position of main axis/position of the sub axis/speed of the sub axis/acceleration of the sub axis/Jerk of the sub axis.

b) CAM graph: Position of sub axis is displayed by axis X. The values of sub axis Position/Speed/Acceleration/Jerk are displayed by axis Y.

8.5 Simulation

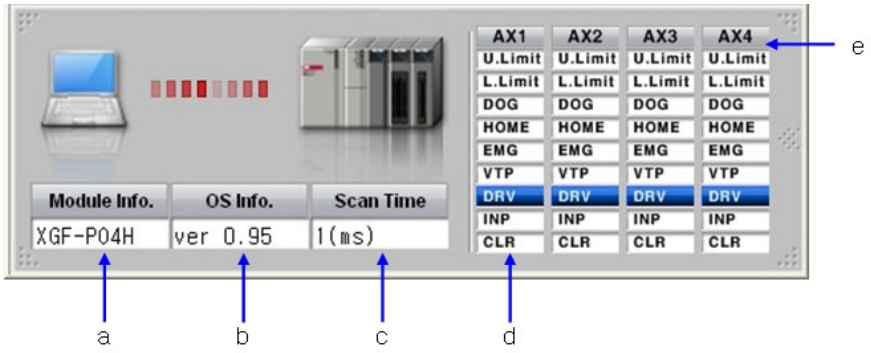
XG-PM provides simulation function that it is confirm performance of positioning module before operation.

8.5.1 Execution of Simulator

[Sequence]

1) Execute Menu[Project]->[New project], create project or execute Menu[Project]->[Open project], open project for simulation.
2) Menu [Instrument]-> [Starting simulator].
3) Confirm Module information of simulator, OS information, Scan time.
4) Confirm performance of positioning module.
5) End simulation by following proceed : Menu [Instrument]->[Simulator End]

[Communication box]



[Explain communication box]

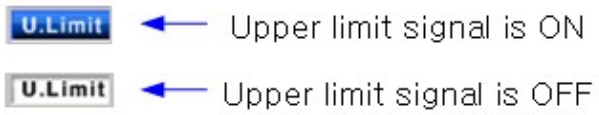
a) Module information: Simulator display module.
b) OS information: Simulator display OS information of simulating module.
c) Scan time: Display cycle of performing command.
d) Setting button of external I/O: Can confirm value of external input/output signal and can set value of external IO.
e) Axis information of external I/O: Display axis information of external I/O.

Note

Simulator can simulate for only a module. Simulator cannot perform with over 2 project module.
Connecting option of situation bar is displayed as “Simulator” while simulator is operating.

8.5.2 External I/O setting of Simulator

External I/O setting screen of simulator only display ON/OFF of external input/output signal regardless of I/O signal HIGH/LOW. External I/O can be set by click the I/O button of pertinent axis.



[External I/O description]
U.Limit : Upper limit signal
L.Limit : Low limit signal
DOG : Approximate origin signal
HOME :Origin signal
EMG : Emergency stop signal
VTP : Speed/Position control conversion signal
DRV : Drive ready signal
INP : In position signal
CLR : Clear signal

Note

Drive ready signal is set as “ON” for convenient. All of the initial status of signal is “OFF” except for drive ready signal.

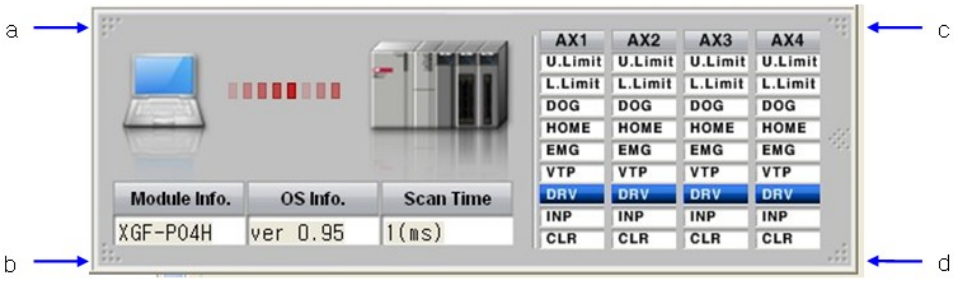
8.5.3 Simulator screen control function

Simulator provides screen position movement and hides function of external I/O setting button for convenient.

(1) Screen position movement

[Sequence]
Click screen movement mark at the corner of simulator screen.

[Communication box]

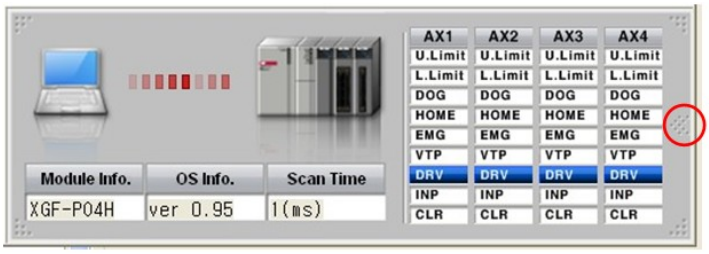


[Explain communication box]

a) Left top corner movement: Simulator move to left top corner movement of XG-PM.
b) Right top corner movement: Simulator move to right top corner movement of XG-PM.
c) Left bottom corner movement: Simulator move to left bottom corner movement of XG-PM.
d) Right bottom corner movement: Simulator move to right bottom corner movement of XG-PM.

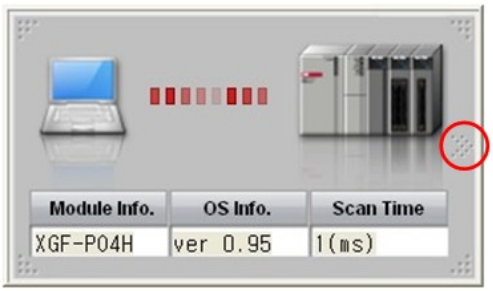
(2) Hiding external I/O setting button

[Sequence]
Click hiding mark of external I/O setting button on the simulator screen.



(3) Displaying external I/O setting button

When external I/O setting button was hided, click showing mark for external I/O setting of simulator screen.



8.5.4 Sight of simulator support function

Simulator can simulate only one module. The function is as following:

(1) Project management function

Function	Feasible or not
New project	O
Open project	O
Project initialization wizard	X
Save project	O
Close project	O
Print	O
Preview	O
Printing project	O
Setting project	O
The latest project	O
Exit	O

(2) Online & Connecting module function

Function	Feasible or not
Connect/ Disconnect	X
Connection setting	X
Write	O
Read	O
Compare with module	O
Module initialization	O
Online model setting	X
Module information	O
Download O/S	X
Operation command	O

(3) Command function

Function	Detail command	Feasible or not
Basic Command	Error reset	O
	Indirect starting	O
	Direct starting	O
	Deceleration stop	O
	Inching operation	O
	Jog operation	O
	Jog stop	O
Expansion command	Speed synch	O
	Position synch	O
	Positioning speed synch	O
	CAM operation	O
	Ellipse interpolation	O
	Start at the same time	O
Changing command	Position override	O
	Speed override	O
	Positioning speed override	O
	Current position preset	O
	Encoder preset	O
	Starting step	O
	Repeating step	O
Teaching command	Plural teaching / Teaching value	O
Point command	Point operation	O
Tool bar command	Function command	O

(4) Monitoring function

Function	Feasible or not
Start monitoring	O
Axis monitor pause	O
System view monitoring	O
Trend monitoring	O
Data Trace	O
External I/O Monitoring	O

(5) Other function

Function	Feasible or not
Multi module online	X

Chapter 9 Write/Read/Comparison data

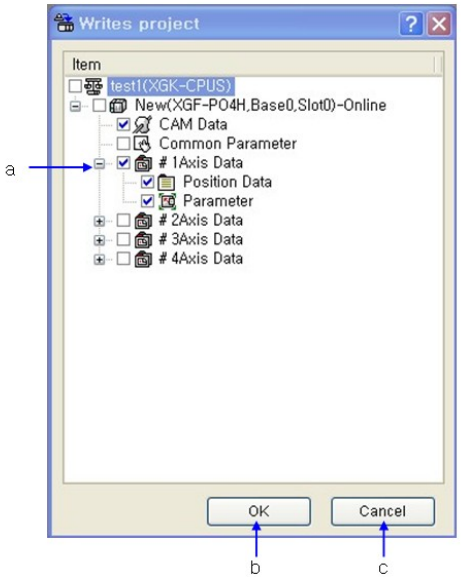
9.1 Write data

Send Cam setting data/operation parameter/operation data to module.

[Sequence]

1) Select “Menu [Online]->[Connect]” connect with module and online.
2) Select “Menu [Online]->[Write]”
3) Select data and confirm for sending to module.

[Communication box]



[Explain communication box]

a) Select tree: Select data for sending to module.
b) Confirm button: Begin to send data to module with confirm button.
c) Cancel button: Stop writing with cancel button.

Note

1. Cannot use corresponding data while it is operating.
   (Operation data/Operation parameter/Servo parameter)
2. Common parameter and CAM data can write while it is operating.

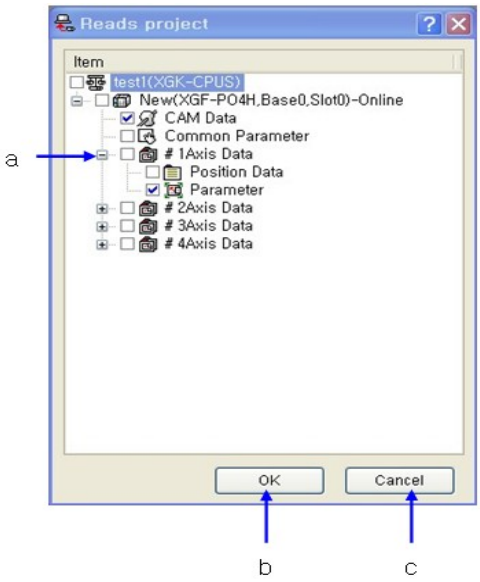
9.2 Read data

Read CAM setting data/operation parameter/operation data from selected online module by user.

[Sequence]

1) Select “Menu [Online]->[Connect]” connect with module and online.
2) Select “Menu [Online]->[Read]”.
3) Select data and confirm for reading data from module.

[Communication box]



[Explain communication box]

a) Select tree: Select data which it is red from module.
b) Confirm button: Begin to read data from module with confirm.
c) Cancel button: Stop reading with cancel button.

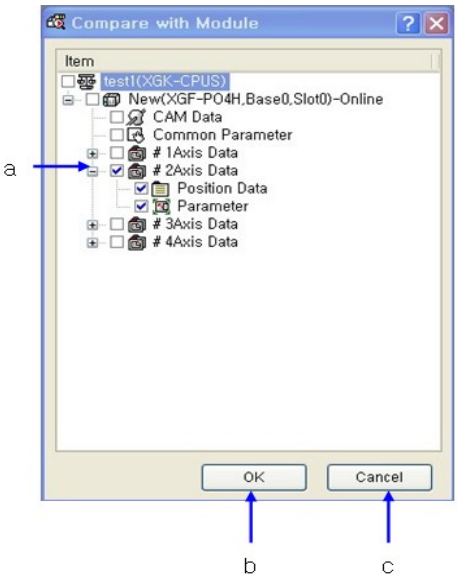
9.3 Comparison Data

Read CAM setting data/ operation parameter/ operation data from selected online module by user, compare with project data and display the result on the screen.

[Sequence]

1) Select “Menu [Online]->[Connect]”connect with module by online.
2) Select “Menu [Online]->[Compare with module]”.
3) Have to select comparison data and confirm for comparing data with module, then read selected data from module.

[Communication box]

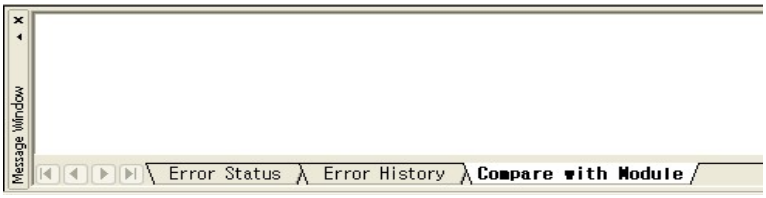


[Communication box description]

a) Select tree: Select comparison data which data is compare with project data on the module.
b) Confirm button: Begin to read data with confirm.
c) Cancel button: Stop to read with cancel button.

Note

The data comparison result is displayed on the [Compare with module] of message window.



Chapter 10 Test Run by XG-PM

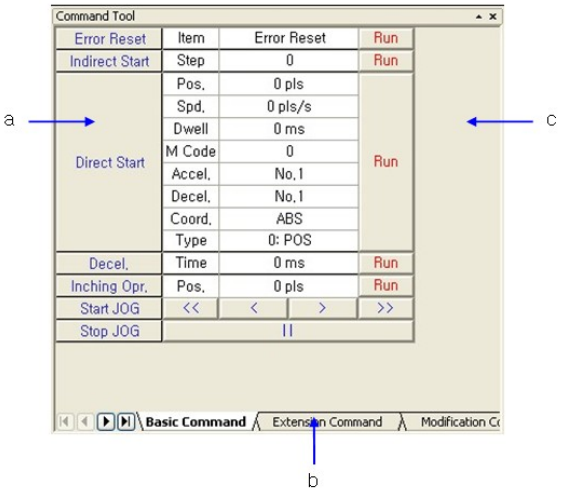
Here descript about test running XG-PM.

10.1 Composition of a Picture of Test Run

10.1.1 Composite command screen

Command screen is composite by 5 tab(Basic command/ Expansion command/ Conversion command/ Teaching command/ Point command). Basic composition of command screen is as following:

[Composition of a picture]



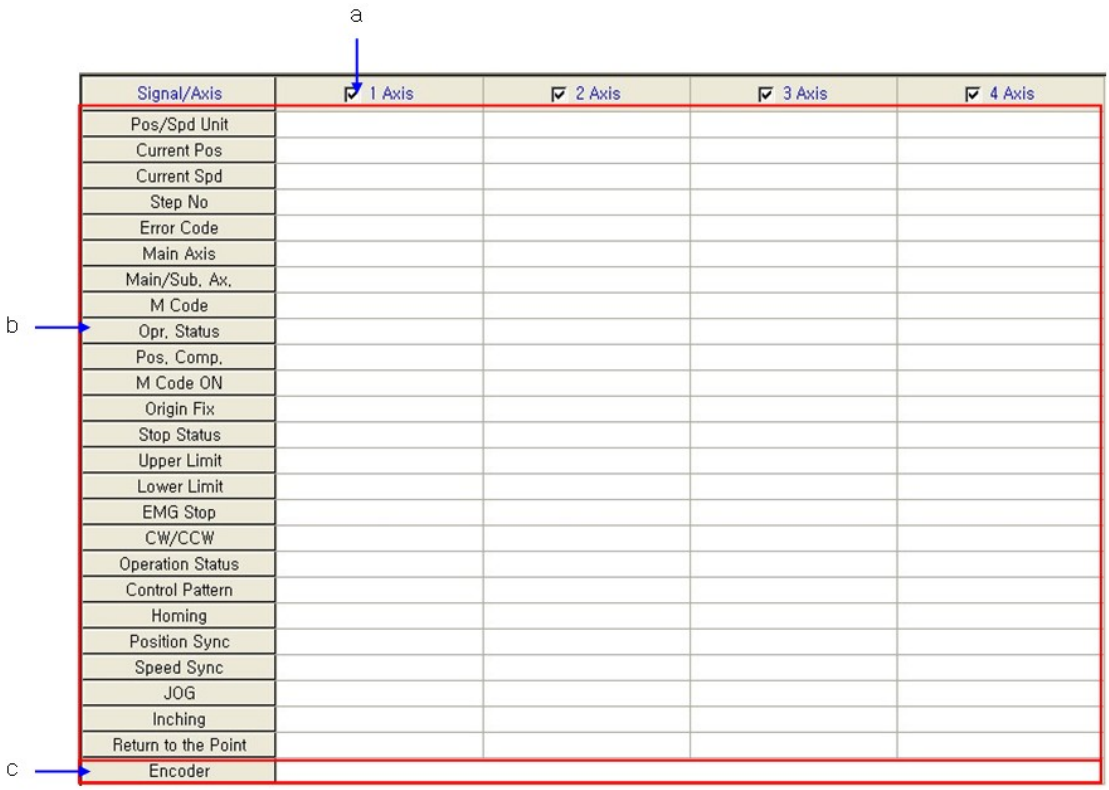
[Screen explanation]

a) Data setting: Set the data which user wants to command.
b) Conversing command tab: User can select what he wants to use within command screen.
c) Action button: Operate with action button.

10.1.2 System View

XG-PM provides module and servo status with one screen of system view. User can easily confirm operation status of each axes, encoder value by system view screen.

[Composition of a Picture]



[Screen description]

a) Monitoring revitalization check box: Revitalize (check)/not Revitalize (uncheck) function of operation status confirm.
b) Display operation status of each axes: Display operation status of each axes.
c) Display encoder value: Display current encoder value on the screen.

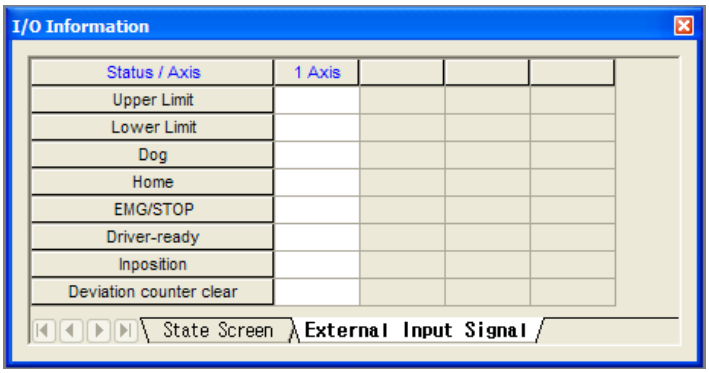
Notes

If cancel monitoring revitalizing check box, XG-PM load can be decrease.

10.1.3 Screen of External Input/Output Signal

External input/output signal screen displays signal status that it is inputted from outside.

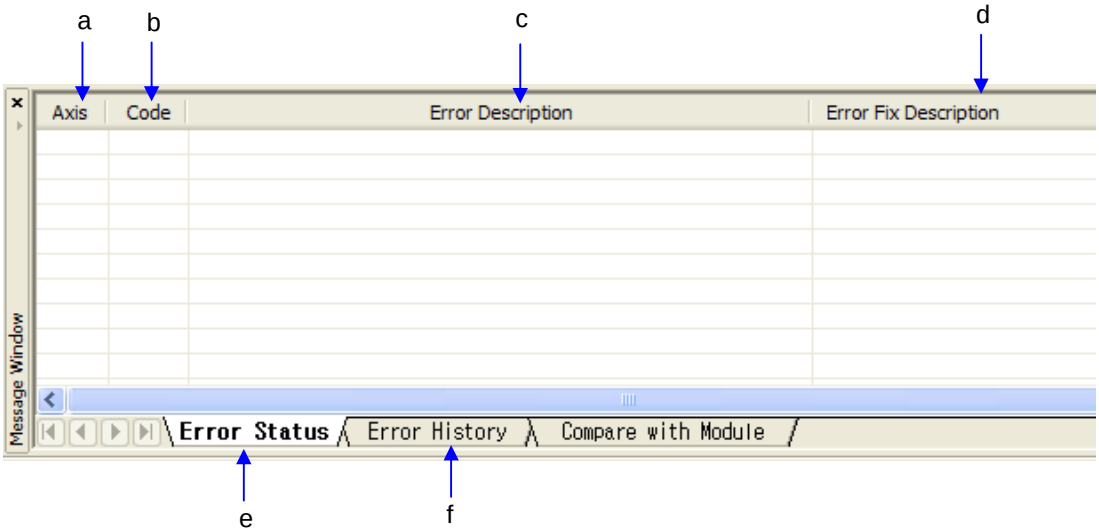
[Composition of a Picture]



10.1.4 Error Message Screen

Display error status and error record of each operating axes.

[Composition of a picture]



[Composition of a Picture]

a) Axis: Display erroneous axis.
b) Code: Display error code.
c) Error explanation: Display detailed explanation of error.
d) Management item: Display management item for cancel error.
e) Error status: Display the latest error. (Display standing in line from axis 1 to axis 4.)
f) Error record: Display error record of each axes. (Can display max 10 for each axes, display standing in line from axis 1 to axis 4.)

10.2 Test Run Mode

Here describes test run of positioning module by XG-PM.

10.2.1 Select Operation Command Axis

[Composition of a picture]

[Explanation of screen]

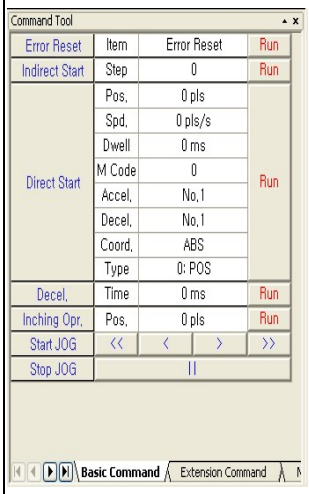
a) Select command module: Select module for command.
b) Select command axis: Select axis for command.

10.2.2 Implementation

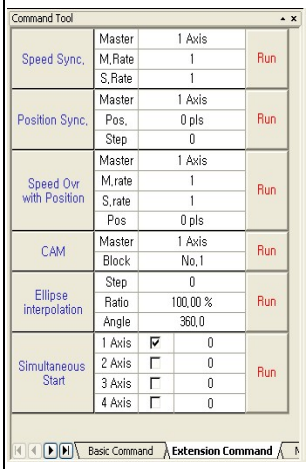
Operate command to selected axis at 10.2.1, when command.

10.2.3 Test Run

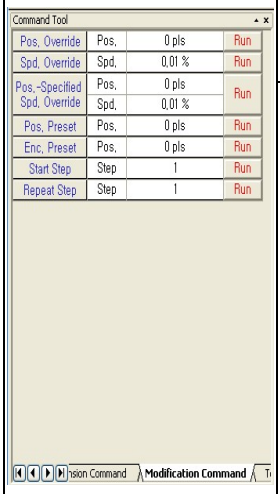
(1) Basic command

Screen	Command	Setting range	Related Command
	Error Reset	Axis error reset/Common error reset	XCLR
	Indirect Start	Step : 1 ~ 400	XIST
	Direct start	1. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [$X10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ degree] 2. Speed (each Unit range) pulse : 0 ~ 4,000,000 [pulse/sec](XGF-PDxH) pulse : 0 ~ 500,000 [pulse/sec](XGF-POxH) mm : 0 ~ 4,000,000 [$X10^{-2}$ mm/min](XGF-PDxH) mm : 0 ~ 500,000[$X10^{-2}$ mm/min] (XGF-POxH) inch : 0 ~ 4,000,000 [$X10^{-3}$ inch/min](XGF-PDxH) inch : 0 ~ 500,000[$X10^{-3}$ inch/min](XGF-POxH) degree : 0 ~ 4,000,000[$X10^{-3}$ degree/min](XGF-PDxH) degree : 0 ~500,000[$X10^{-3}$ degree/min](XGF-POxH) 3. Dwell : 0 ~ 65,535 ms 4. M code : 0 ~ 65,535	XDST
	Deceleration stop	Stop time : 0 ~ 2,147,483,647 ms	XSTP
	Inching operation	Amount of Inching : -2,147,483,648 ~ 2,147,483,647 pls	XINCH
	Jog Operation /Stop	Speed (each Unit range) pulse : 0 ~ 4,000,000 [pulse/sec](XGF-PDxH) pulse : 0 ~ 500,000 [pulse/sec](XGF-POxH) mm : 0 ~ 4,000,000 [$X10^{-2}$ mm/min](XGF-PDxH) mm : 0 ~ 500,000[$X10^{-2}$ mm/min](XGF-POxH) inch : 0 ~ 4,000,000 [$X10^{-3}$ inch/min](XGF-PDxH) inch : 0 ~ 500,000[$X10^{-3}$ inch/min](XGF-POxH) degree : 0 ~ 4,000,000[$X10^{-3}$ degree/min](XGF-PDxH) degree : 0 ~500,000[$X10^{-3}$ degree/min](XGF-POxH)	-

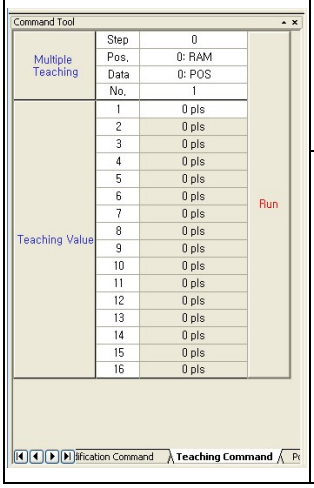
(2) Expansion command

Screen	Command	Setting range	Related command
	Speed synch	1. Main axis range : Axis 1 ~ Axis 4 and Encoder 2. Main axis rate : 1 ~ 65535 3. Sub axis rate : 1 ~ 65535	XSSS
	Position synch	1. Step : 1 ~ 400 2. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} degree] 3. Main axis range : Axis 1 ~ Axis 4 and Encoder	XSSP
	CAM operation	1. Main axis range : Axis 1 ~ Axis 4 2. CAM block : No.1 ~ No.8	XCAM
	Ellipse interpolation	1. Step: 1 ~ 400 2. Range: 0 ~ 65535 [X10^{-2} %] 3. Each operation: 0 ~ 65535 [X10^{-1} degree	XELIN
	Synch start	Axis : Select 1 ~ 4 axis, Step No.: 1 ~ 400	XSST

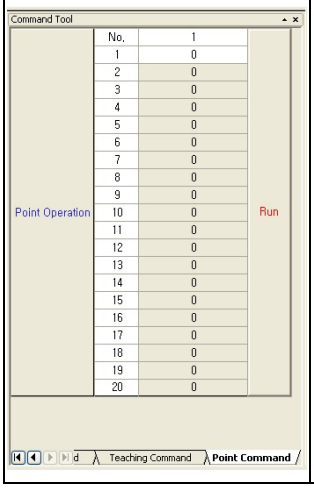
(3) Change command

Screen	Command	Setting range	Related command
	Position override	Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} degree]	XPOR
	Speed Override	Speed (In case of designating %) 0 ~ 65535 [X10^{-2} %] Speed (In case of designating speed, each Unit range) pulse : 0 ~ 4,000,000 [pulse/sec](XGF-PDxH) pulse : 0 ~ 500,000 [pulse/sec](XGF-POxH) mm : 0 ~ 4,000,000 [X10^{-2} mm/min](XGF-PDxH) mm : 0 ~ 500,000[X10^{-2} mm/min] (XGF-POxH) inch : 0 ~ 4,000,000 [X10^{-3} inch/min](XGF-PDxH) inch : 0 ~ 500,000[X10^{-3} inch/min] (XGF-POxH) degree : 0 ~ 4,000,000[X10^{-3} degree/min](XGF-PDxH) degree : 0 ~500,000[X10^{-3} degree/min](XGF-POxH) (To be decided designating % or designate speed or undesignating speed by [Speed Override] parameter setting of common parameter.)	XSOR
	Positioning Speed Override	1. Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} degree] 2. Speed(In case of designating %) 0 ~ 65535 [X10^{-2} %] Speed (In case of designating speed, each unit range) pulse : 0 ~ 4,000,000 [pulse/sec](XGF-PDxH) pulse : 0 ~ 500,000 [pulse/sec](XGF-POxH) mm : 0 ~ 4,000,000 [X10^{-2} mm/min](XGF-PDxH) mm : 0 ~ 500,000[X10^{-2} mm/min] (XGF-POxH) inch : 0 ~ 4,000,000 [X10^{-3} inch/min](XGF-PDxH) inch : 0 ~ 500,000[X10^{-3} inch/min] (XGF-POxH) degree : 0 ~ 4,000,000[X10^{-3} degree/min] XGF-PDxH) degree : 0 ~500,000[X10^{-3} degree/min](XGF-POxH) (To be decided designating % or designate speed or undesignating speed by [Speed Override] parameter setting of common parameter.)	XPSO
	Current position preset	1. Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} degree]	XPRS
	Encoder Preset	1. Position : -2,147,483,648 ~ 2,147,483,647 [pulse]	XEPRS
	Start step	Step : 1 ~ 400	XSNS
	Repeat step	Step : 1 ~ 400	XSRS

(4) Teaching Command

Screen	Command	Setting range	Related command
	Plural teaching	1. Step : 1 ~ 400 2. System : 0 (RAM teaching), 1 (ROM teaching) 3. Method : 0 (Position teaching), 1 (Speed teaching) 4. The number : 1 ~ 16	XTEAA
	Teaching value	Position pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [$X10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ degree]	

(5) Point operation

Screen	Command	Setting range	Related command
	POINT Operation	1. The number : 1 ~ 20 2. Point setting (0 ~ 19) : 1 ~ 400 => Operation step setting	XPST

(a) Point operation operate maximum 20 set operation step positioning by once.
(b) When set the step number, have to set highest step No. while operating mode is continue or consecutive.
(c) When operate point operation, if set the number of point, below item(0~19) is revitalized as the set number.

10.2.4 Jog Operation

Operate to Jog command by clicking Jog operation icon.

Screen	Icon	Command	Related command
	<<	Reverse high speed jog operation.	-
	<	Reverse low speed jog operation.	
	>	Forward low speed jog operation	
	>>	Forward high speed jog operation	
	||	Jog operation stop	

10.3 Command Icon

Can easily process command, executed solely without command condition, through icon

[Composition of a picture]

[Screen description]

Command Icon	Command contents	Operation description	Shortcut key
	Axis stop	Designated axis deceleration command	
	Emergency stop	Internal emergency stop command during operation.	
	Homing	Homing command.	
	Immoveable origin setting	Origin setting command by software.	
	Speed/Position Conversion	This command for converse to positioning control during speed control operation.	
	Position/Speed Conversion	This command for converse to speed control during speed control operation.	
	Skip operation	Stop current operating step and operate next step.	
	Consecutive operation	Operation pattern of current operation step change to consecutive operation, operate to next step without stop section.	
	Manual operation before homing	Operate manual operation (jog operation, inching operation) after complete positioning operation, then in case of positioning spot is changed, it is moved to positioning completion spot before manual operation.	
	Cancel M Code	This command cancels M code.	
	Error history reset	Clear current error history during operation.	
	Error reset	Clear current error during operation.	

10.4 Example of Test Run

Here describes example of test run when test run needed.

10.4.1 Jog Operation

Following example describes jog operation for testing initialize operation after connect with motor.

[Sequence]

1) Make a new project by proceeding [Project]->[New project].
2) Proceed [Online]->[connect] , online with module.
3) Revitalize operation parameter screen of axis for performance.
4) Set jog parameter of manual operation parameter on the operation parameter.
   (Set Jog high speed/Jog low speed/Jog acceleration time/Jog deceleration time)
5) Proceed [Online]->[Write] , write the set jog parameter to module.
   (Please refer to this manual 9.1 writing data for method of writing.
6) Select axis for performing jog operation at the command tool.
   (Please refer to 10.2.1. select of command axis.)
7) Proceed jog operation with basic command tab of command tool window.
8) Confirm jog operation by system view screen.

[Confirm performance]

Following example is system view screen after performing jog operation on the axis 1, axis 2.
(Perform automatically monitoring function when perform jog operation.)

	Signal/Axis	1 Axis	2 Axis	3 Axis	4 Axis
a →	Pos/Spd Unit				
	Current Pos				
	Current Spd				
	Step No				
	Error Code				
	Main Axis				
	Main/Sub. Ax.				
	M Code				
	Opr. Status				
	Pos. Comp.				
	M Code ON				
	Origin Fix				
	Stop Status				
	Upper Limit				
	Lower Limit				
	EMG Stop				
	CW/CCW				
b →	Operation Status				
c →	Control Pattern				
	Homing				
	Position Sync				
	Speed Sync				
	JOG				
	Inching				
	Return to the Point				
	Encoder				

a) Command speed: When proceed jog low(high) speed operation, set value will be displayed by operation parameter.
b) Operation status: Operation status is displayed as “Steady speed” while it is jog operating.
c) Control pattern: Operation status is displayed as “Jog operating” while jog operating.

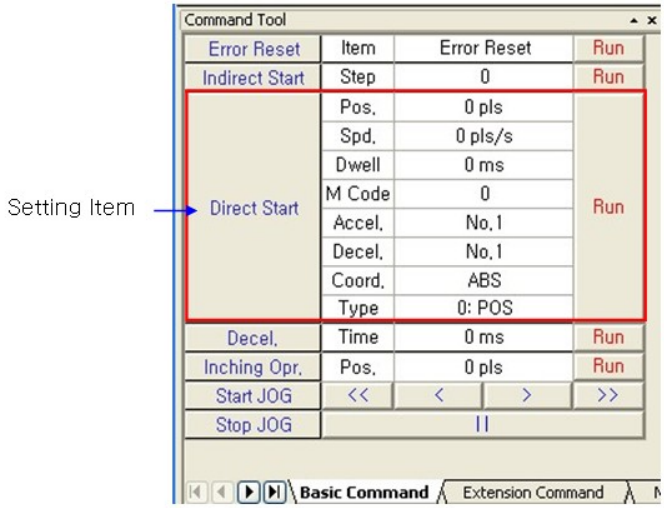
10.4.2 Direct Start (Shortcut position control)

Here describes Shortcut position control by direct start.

[Sequence]

1) Create new project by proceeding [Project]->[New project].
2) Online module by proceeding [Online]->[Connect].
3) Execute stability origin setting command for directing start operation.(shortcut icon).
4) Revitalize basic command tab of command tool window.
5) Execute direct start by operation condition.

[Setting screen]



[Setting value]

Setting item	Setting value	Content
Position	100,000 pls	Operate motor to 100,000 pls.
Speed	10,000 pls/s	Operate motor as 10,000 pls/s.
Dwell	100 ms	Dwell time is 100ms after operating.
M code	10	M code is 10 while it is operating. ex1)
Acceleration	No.1	Operate No.1 during accelerating.
Deceleration	No.1	Operate No.1 during accelerating.
Coordinate	Absolute	Operate absolute position coordinate.
Method	Position control	Operation method operates by position control method.

ex1) M code mode(Operation parameter->Expansion parameter) should be set as 1 : With(Display M code during operating) or 2 : After(Display M code after operating) for displaying M code on screen.

Confirm M code after operation complete by set 2.

[Confirm operation]

This is a screen of system view after operation complete when it is operating by data setting.

	Signal/Axis	1 Axis	2 Axis	3 Axis	4 Axis
	Pos/Spd Unit	pls,pls/s	pls,pls/s	pls,pls/s	pls,pls/s
a →	Current Pos	0	0	0	0
a →	Current Spd	0	0	0	0
	Step No	1	1	1	1
	Error Code	355	0	0	0
	Main Axis	1 Axis	2 Axis	3 Axis	4 Axis
	Main/Sub_Ax	Master	Master	Master	Master
b →	M Code	0	0	0	0
	Opr. Status				
	Pos. Comp.				
c →	M Code ON				
	Origin Fix				
	Stop Status				
	Upper Limit				
	Lower Limit				
	EMG Stop				
	CW/CCW	CW	CW	CW	CW
	Operation Status				
	Control Pattern				
	Homing				
	Position Sync				
	Speed Sync				
	JOG				
	Inching				
	Return to the Point				
	Encoder	0			

a) Current position: Current position display target position value 100,000.

b) M code No.: Display setting value 10.

c) M code On : Current M code display 10, display M code on the screen.

Notes

Cancel M code On: In case of displaying M code, Have to cancel M code for operating other command when it is restart after operation complete.

M code can be cancelled by [Cancel M code] on the command tool bar. (shortcut Icon)

10.4.3 Indirect Start (Shortcut position control and circular interpolation)

Following example describes about operation method by indirect start (operation data).

(1) Shortcut position control

[Sequence]

1) Create new project by proceeding [Project]->[New project].
2) Online module by proceeding [Online]->[Connection].
3) Operate stability origin setting command on the axis for direct start. (Shortcut Icon).
4) Set data after revitalize operation data screen of axis for start. (Proceed simply view after revitalize)
5) Write operation data to module by proceeding [Online]->[Write].
   (Refer to this manual 9.1 writing data for execution method)
6) Revitalize basic command tab of command tool window.
7) Set step No. of indirection start item and click the start button.

[Setting screen]

Setting Item →

1 Axis	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS, (SNG)POS	SNG, END	1000000	100000	No.1	No.1	10	0
2	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
3	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
4	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
5	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
6	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
7	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
8	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0

New, 1Axis, Position ...

Setting Item →

Command Tool

Error Reset	Item	Error Reset	Run
Indirect Start	Step	0	Run
Direct Start	Pos.	0 pls	Run
	Spd.	0 pls/s	
	Dwell	0 ms	
	M Code	0	
	Accel.	No.1	
	Decel.	No.1	
	Coord.	ABS	
	Type	0: POS	
Decel.	Time	0 ms	Run
Inching Opr.	Pos.	0 pls	Run
Start JOG	<<	< >	>>
Stop JOG		II	

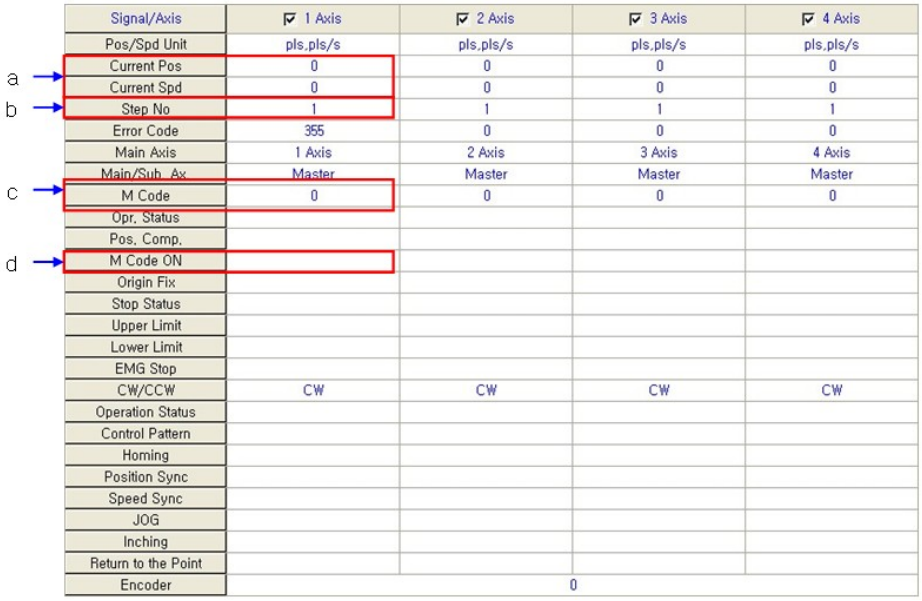
Basic Command | Extension Command

[Setting value]

Setting item	Setting value	Contents
Control method	Absolute, Shortcut position control	Execute position control operation by absolute coordinate.
Operation method	Single, End	Execute single stop operation of current step.
Target position	1,000,000 pls	Operate motor to 1,000,000 pls.
Operation speed	100,000 pls/s	Operate motor as 100,000 pls/s.
Acceleration No.	No.1	Set acceleration speed as No.1.
Deceleration No.	No.1	Set deceleration speed as No.1.
M code	10	M code is 10, when it is operating.
Dwell time	0 ms	Dwell time is 0ms after operation.

[Confirm perform]

This picture is the system view screen of operation complete by data setting.
(It is same with result of 10.4.2 direct start(shortcut position control).



Signal/Axis	1 Axis	2 Axis	3 Axis	4 Axis
Pos/Spd Unit	pls,pls/s	pls,pls/s	pls,pls/s	pls,pls/s
Current Pos	0	0	0	0
Current Spd	0	0	0	0
Step No	1	1	1	1
Error Code	355	0	0	0
Main Axis	1 Axis	2 Axis	3 Axis	4 Axis
Main/Sub Ax	Master	Master	Master	Master
M Code	0	0	0	0
Opr. Status				
Pos. Comp.				
M Code ON				
Origin Fix				
Stop Status				
Upper Limit				
Lower Limit				
EMG Stop				
CW/CCW	CW	CW	CW	CW
Operation Status				
Control Pattern				
Homing				
Position Sync				
Speed Sync				
JOG				
Inching				
Return to the Point				
Encoder	0			

a) Current position: Current position display target value 100,000.
b) Step No.: Display 2 as next step of indirect step.
c) M code No.: Display setting value 10.
d) M code ON: Display current M code 10 and Display M code on current screen.

Notes

Can change operation data displaying item for convenient by menu on display part of each axes, when set operation data.
(View detail / Simply detail function, refer to manual 8.3.1)

(2) Circular Interpolation

[Sequence]

1) Create new project by proceeding [Project]->[New project].
2) Online module by proceeding [Online]->[Connect].
3) Execute stability origin setting command on the axes(axis1, axis2) for circular interpolation.(Shortcut Icon).
4) Revitalize operation data screen of axis which need to start and set data. (Execute detailed view after revitalize)
5) Write operation data to module by proceeding [Online]->[Write].
   (Refer to this manual 9.1 writing data for execution)
6) Revitalize basic command tab of command tool window.
7) Revitalize XY graph after proceeding [Monitoring]->[Trend Monitoring] .
8) Set current position(axis X: 1, axis Y: 2) after proceeding [Graph]->[Trend device setting].
   (Refer to this manual 11.6 data trend for setting.)
9) Click start button after setting step No. of indirect start item as 1.
   (Then command axis should be set axis1. Axis1 is main executing axis on the below example.)

[Setting screen]

1 axis data setting

1 Axis	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]	Sub. axis setting	Cir. int. auxiliary point	Cir. int. mode	Circular int. turns	Helical int.
1	ABS, (SNG)POS	SNG, END	10000	10000	No.1	No.1	10	0	None	50000	Middle-Point	0	Don't Use
2	ABS, (SNG)POS	SNG, END	0	10000	No.1	No.1	20	0	None	50000	Middle-Point	0	Don't Use
3	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
4	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
5	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use

2 axis data setting

2 Axis	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]	Sub. axis setting	Cir. int. auxiliary point	Cir. int. mode	Circular int. turns	Helical int.
1	ABS, (SNG)POS	SNG, END	0	10000	No.1	No.1	10	0	None	0	Middle-Point	0	Don't Use
2	ABS, (SNG)POS	SNG, END	0	10000	No.1	No.1	20	0	None	0	Middle-Point	0	Don't Use
3	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
4	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
5	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use

[Setting value]

[Axis 2 data]

Setting item	Setting value		Content
	Step 1	Step 2	
Control type	Absolute, circular interpolation	Absolute, circular interpolation	Execute circular interpolation operation by absolute coordinate.
Operation type	Single, continue	Single, End	Execute 2 step to succeed 1 step.
Target position[pls]	1,000,000 pls	0 pls	Operate motor to 1,000,000 -> 0 pls
Operation speed[pls/s]	100,000 pls/s	100,000 pls/s	Operate motor as 100,000 pls/s.
Accel No.	No.1	No.1	Set acceleration speed as No.1.
Decel No.	No.1	No.1	Set deceleration speed as No.1.
M code	10	20	Display M code as 10, 20 while operating.
Dwell time[ms]	0 ms	0 ms	Dwell time is 0ms after operating.
Sub axis setting	Axis 2	Axis 2	Sub axis is axis1, sub axis is axis2, when it is setting.
Cir. int. auxiliary point	500,000	500,000	Auxiliary point(center point) is (500,000, 0).
Cir. int. mode	Center point, CW	Center point, CW	Operate to CW by center point method.

[Axis 2 data]

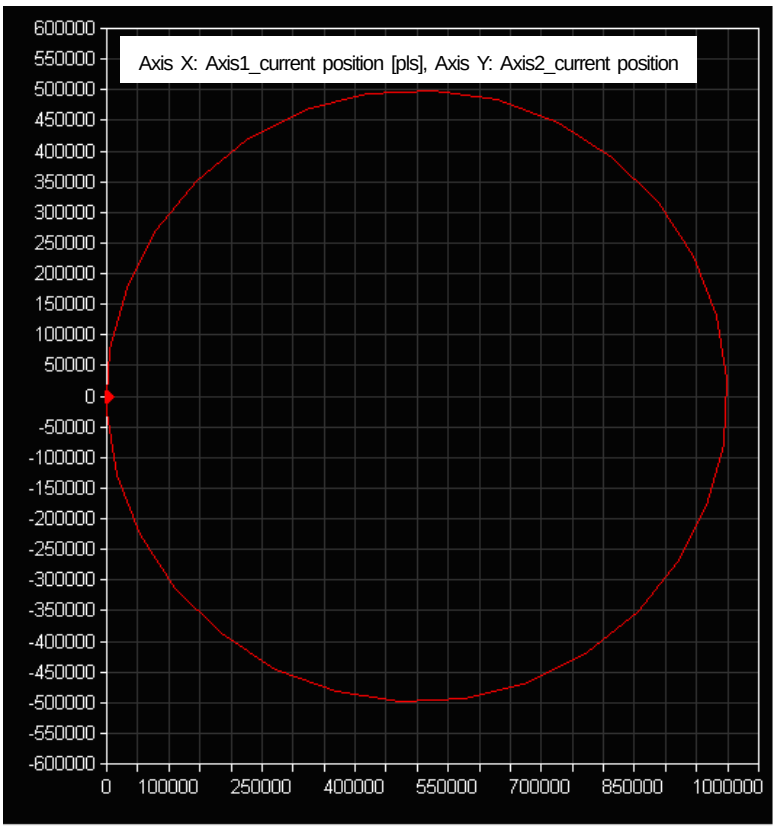
Setting item	Setting value		Content
	Step 1	Step 2	
Control type	Absolute, Circular interpolation	Absolute, Circular interpolation	Execute circular interpolation operation as absolute coordinate.
Operation type	Single, Continue	Single, End	Execute 2 step to succeed 1 step.
Target position[pls]	0 pls	0 pls	Starting point and end point are both 0 pls.
Operation	100,000 pls/s	100,000 pls/s	Operate motor as 100,000 pls/s.
Accel No.	No.1	No.1	Set acceleration speed as No.1.
Decel No.	No.1	No.1	Set deceleration speed as No.1.
M code	10	20	Display M code as 10, 20 while operating.
Dwell time[ms]	0 ms	0 ms	Dwell time is 0ms after operating.
Sub axis setting	Axis unset	Axis unset	Main axis is axis1, sub axis is axis2, when it is setting.
Cir. int. auxiliary point	0	0	Auxiliary point(center point) is (500,000, 0).
Cir. int. mode	Center point, CW	Center point, CW	Operate to CW by center point method.

[Confirm operation]

This is XY graph on the trend screen after operation complete by data setting.

This is an example for drawing circle that center point is (500000, 0), Radius is 1000000.

(Axis X is current position of axis1, axis Y is current position of axis2.)



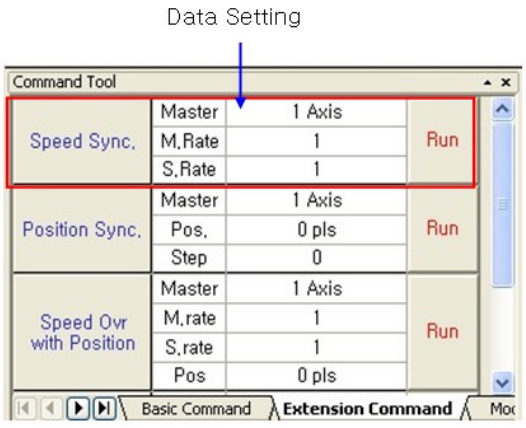
10.4.4 Speed Synch

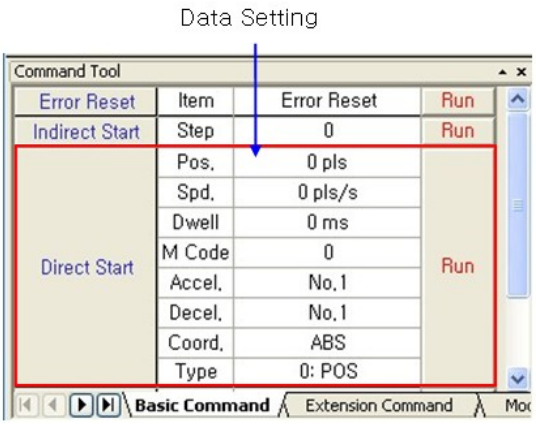
Speed synch means that sub axis operate speed synch as set rate, even if main axis speed is variable by operation speed rate of sub/main axis. Following example shows example of speed synch operation.

[Sequence]

1) Create new project by proceeding [Project]->[New project].
2) Online module by proceeding [Online]->[Connection].
3) Execute stability origin setting command on the axis for speed synch operation(axis1 and axis2).(Shortcut Icon).
4) Write operation parameter to module by proceeding [Online]->[Write].
   (Refer to 9.1. writing data for writing execution method.)
5) Click the speed synch execution button after setting speed synch item on the expansion command tab of command tool window. (Refer to setting data.)
6) Set the indirect start item on the basic command tab of command tool window. (refer to setting data)
7) Revitalize trend graph tab after operating data trace program by proceeding [Monitor]->[Data trace].
   Set axis 1 command speed, axis 2 command speed on the word device setting tab after proceeding [Trace]->[Trace setting] of date trace program. (Refer to this manual 11.7 data trace for setting.)
8) Set command axis as axis1 and execute direct start.
9) Confirm operating by system view and data trace.

[Setting screen]





[Setting value]

[Operation parameter setting]

Setting item	Setting value		Content
	Axis 1	Axis 2	
Acceleration time 1	10000 ms	10000 ms	Axis1,2 deceleration time setting (Each axis operation parameter => Set on the basic parameter)
Deceleration time 1	10000 ms	10000 ms	Axis1,2 deceleration time setting (Each axis operation parameter => Set on the basic parameter)

[Speed synch item setting]

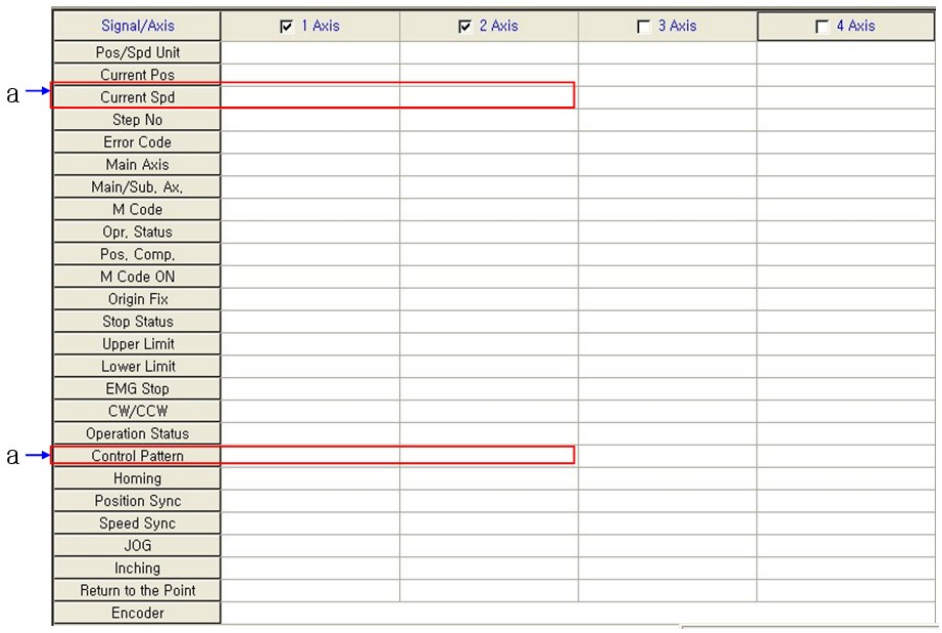
Setting item	Detail item	Setting value	Content
Speed synch	Main axis	1	Set axis1 as main axis.
	Main axis rate	1	Set 1 as main axis speed rate.
	Sub axis rate	2	Sub axis speed rate set a multiple to main axis.

[Speed synch item setting]

Item	Detail item	Setting value	Content
Direct start	Command axis	2	Set axis2 as main axis. (refer to this manual 10.2.1)
	Position	50,000 pls	Set starting position.
	Speed	10,000 pls/s	Set starting speed.

[Confirm Operation]

[System view]

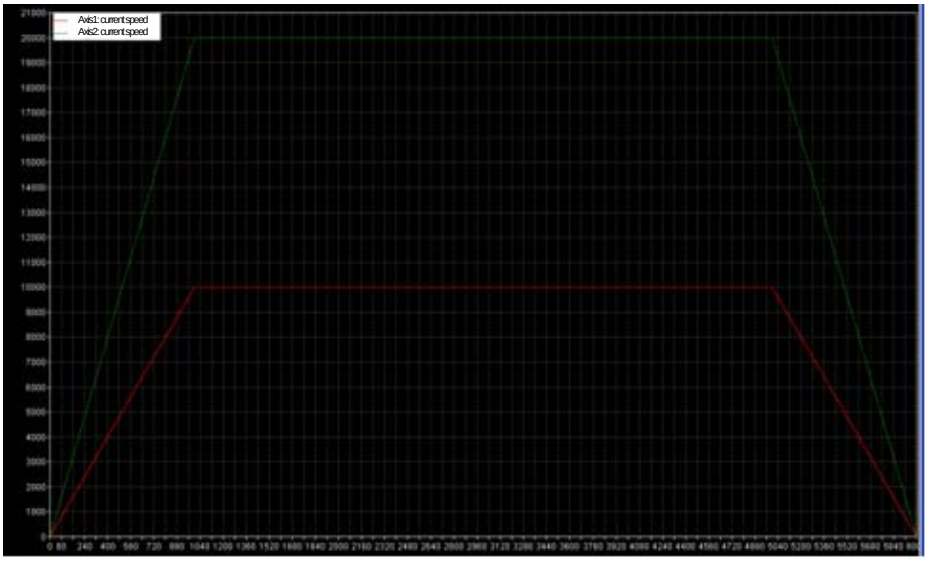


a) Command speed: Axis 2 speeds increase to 2 times of axis 1 speed with operating.

b) Operation control form: In case of axis1, display as axis1 position control operation, axis2 operation control is displayed as speed synch.

[Data trace]

This is a trend graph after operating by upper data setting.
Can confirm that the steady speed section speed of axis1 is 10,000 pls/s, the steady speed section speed of axis2 is 20,000 pls/s. (Speed synch main axis : Sub axis speed = 1 : 2)



Chapter11 Useful Function of XG-PM

XG-PM provides many useful functions for making project, editing project. XG-PM providing functions are as follows: Plural module batch write/read/comparison for each project, copy data for each unit, synchronizeronizes I/O, data trend, data trace and electronic CAM operation.

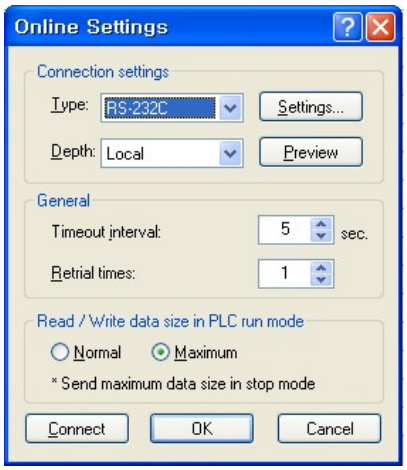
11.1 Project Management Function

11.1.1 Project Initialization Function

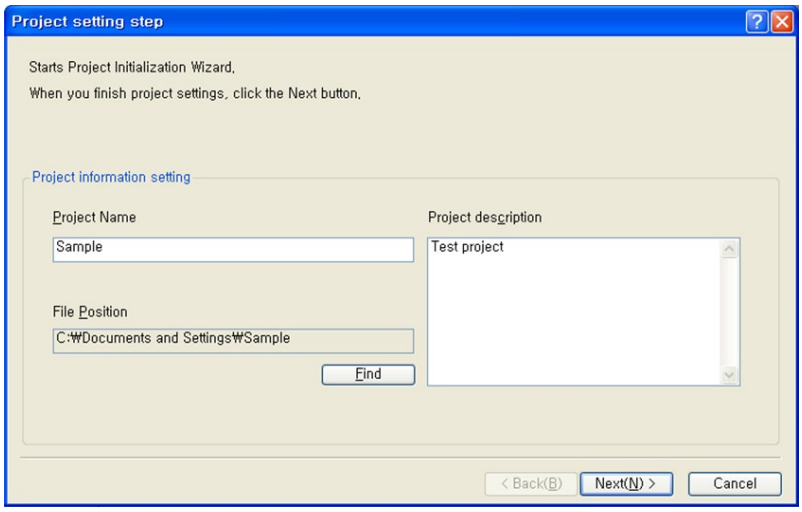
XG-PM provides project initialization function for convenient.

[Sequence]

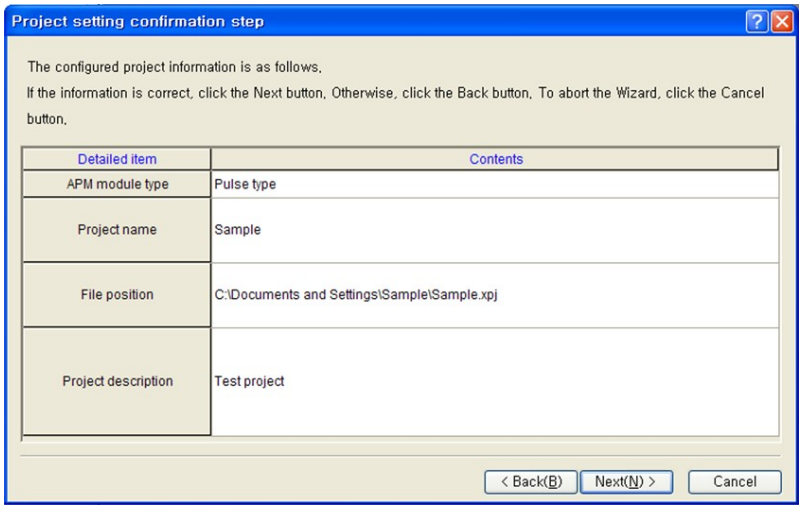
1) Proceed [Project]->[Project Initialization wizard].
2) Project setting communication box is displayed on the screen when click the connection button at connection setting communication box.



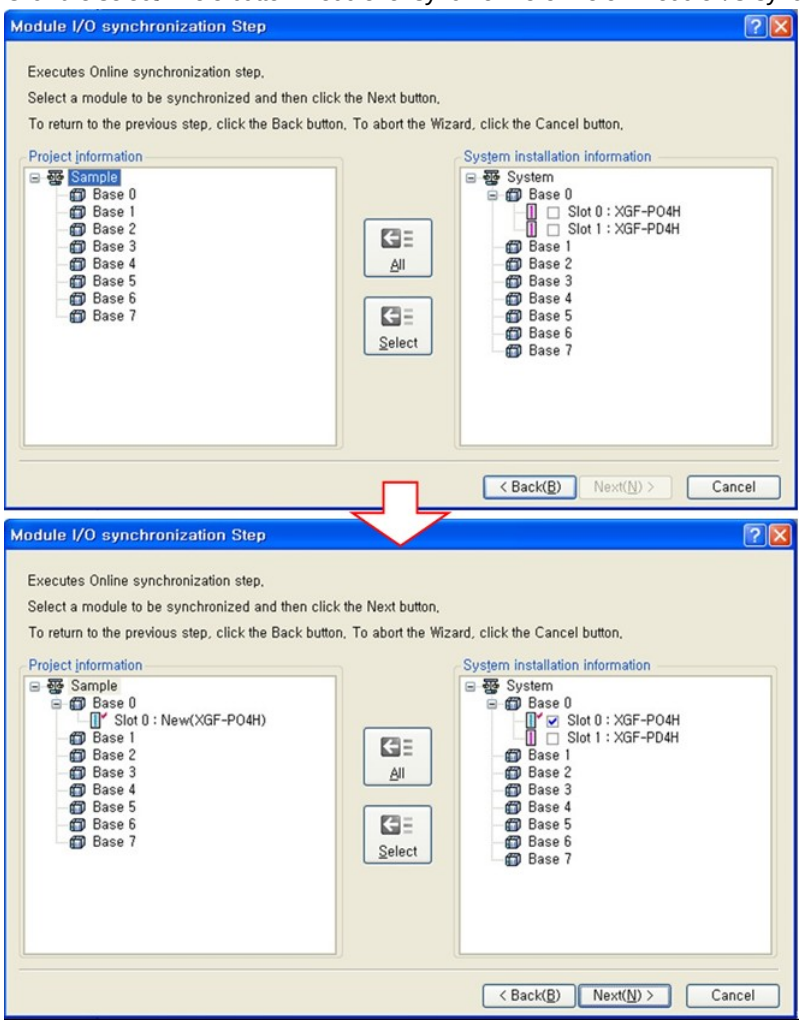
3) Set the project information on the project setting communication box and click the next button.



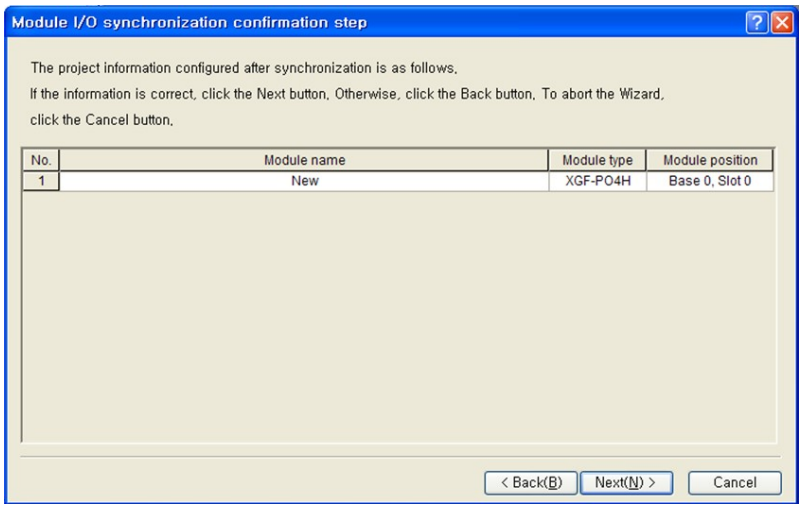
4) Click the next button after confirming set project information at the project setting confirm.



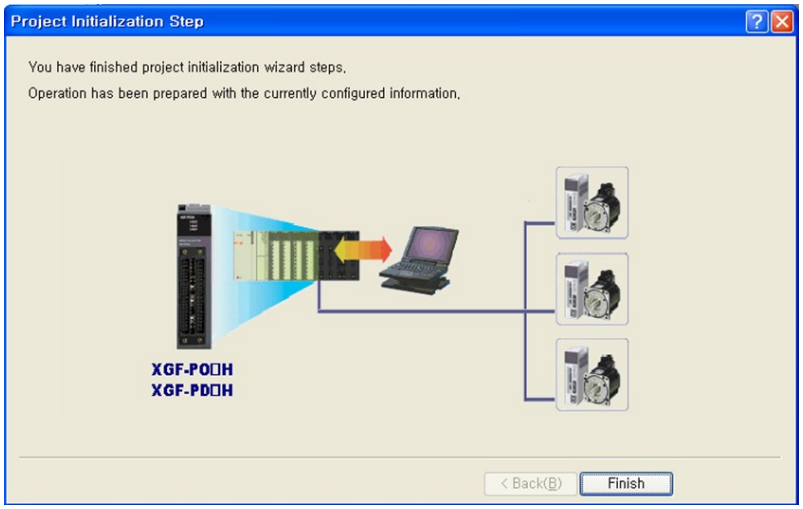
5) Click the select/whole button module for synchronizeronize on module I/O synchronizeronize.



6) Click the next button after confirm synchronizeronized module information on module I/O confirmation step.



7) Click the end button for end of project initializing.



11.1.2 Multi-Module Batch Write/Read/Comparison

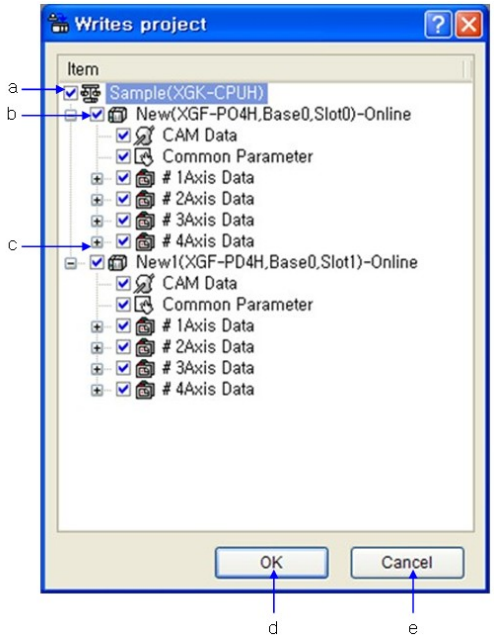
XG-PM provides project management function for multi-module. Basically it provides some functions for write/read/comparison. (Don't need to additional setting, can use menu that are write/read/comparison.)

(1) Write multi-module

[Sequence]

1) Proceed [Online]->[Write].
2) Select item for writing at project write communication box. If the Multi-module is onlined, can writing data to selected module.
3) Click the confirm button after select item.

[Communication box]



[Communication box content]

a) Check for each project: Can write all data of all onlined module for each project by checking.
b) Check for each module: Can write all data item belonged to module.
c) Check for each item: Can write data for each item.
d) Confirm: End communication box. Begin to writing data after end of communication box.
e) Cancel: End communication box.

Notes

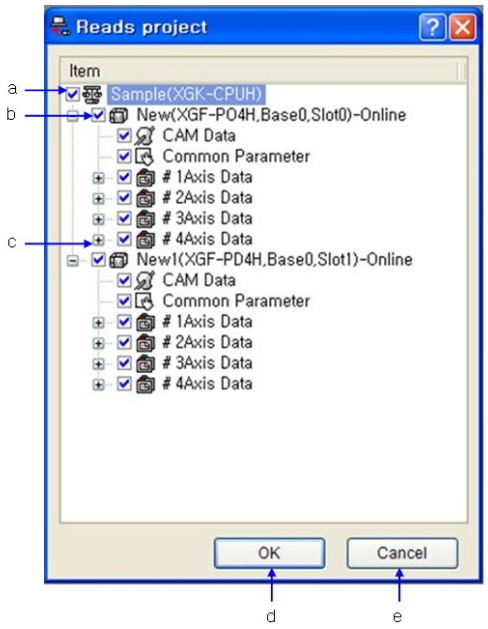
Onlined modules which were set on the project write/read/comparison communication box of current step are displayed only.

(2) Read multi module

[Sequence]

1) Proceed [Online]->[Read].
2) Select item for reading on the project reading communication box. If multi-module was onlined, user can read data to selected module.
3) Select item and confirm.

[Communication box]



[Communication box description]

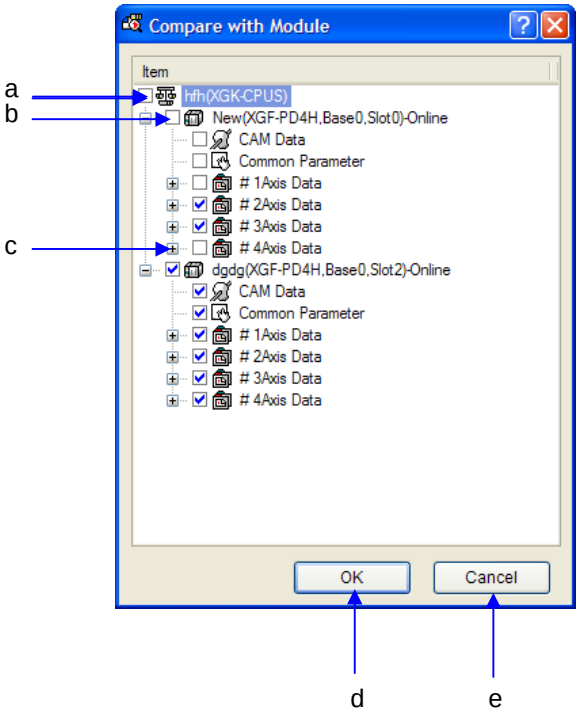
a) Check for each project: Can read all data item of all onlined module for each project by chenking this part.
b) Check for each Module: Read all data item belonged to module.
c) Check for item: Can read data for each item.
d) Confirm: End the communication box. Begine to read data after ending communication box.
e) Cancel: End communication box.

(3) Multi-module comparison

[Sequence]

1) Proceed [Online]->[compare with module].
2) Select item for on the module and data comparison communication box. Select item for comparison on the module and data comparison communication box. If the multi-module is onlined, can compare data with selected module by user.

[Communication box]



[Communication box description]

a) Check for each project: If check this item, can compare all data item of all onlined module for each project.
b) Check for each module: Can compare all data item which is belonged to module.
c) Check for each item: Can compare data for each item.
d) OK: End communication box. Begin to read data after end of communication box.
e) Cancel: End communication box.

11.2 Editing Data Function

XG-PM provides useful function for editing each data contents.
It provides basic editing function which are data copy/Paste, even if provides initializing function for each item. And it provides editing data function that the function proceeds without other calculating by auto-fill function and auto-unit changes function.

11.2.1 Copy/Paste

When user edit Common parameter/Operation parameter/operation data, partially can proceed copy/Paste.

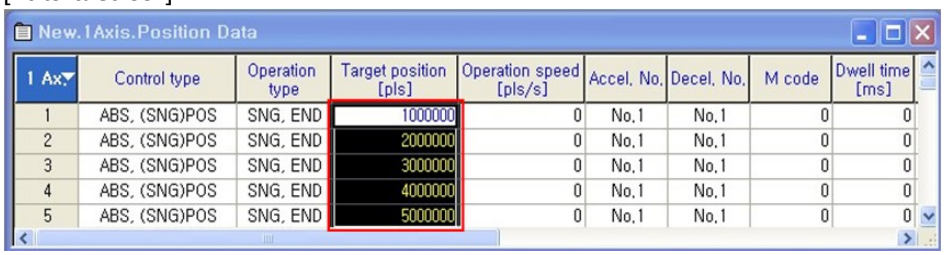
(1) Copy

Copy selected range to clip board.

[Sequence]

1. Select copy for range.
2. Click [Edit]->[Copy].

[Editorial screen]



1 Ax	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS, (SNG)POS	SNG, END	1000000	0	No.1	No.1	0	0
2	ABS, (SNG)POS	SNG, END	2000000	0	No.1	No.1	0	0
3	ABS, (SNG)POS	SNG, END	3000000	0	No.1	No.1	0	0
4	ABS, (SNG)POS	SNG, END	4000000	0	No.1	No.1	0	0
5	ABS, (SNG)POS	SNG, END	5000000	0	No.1	No.1	0	0

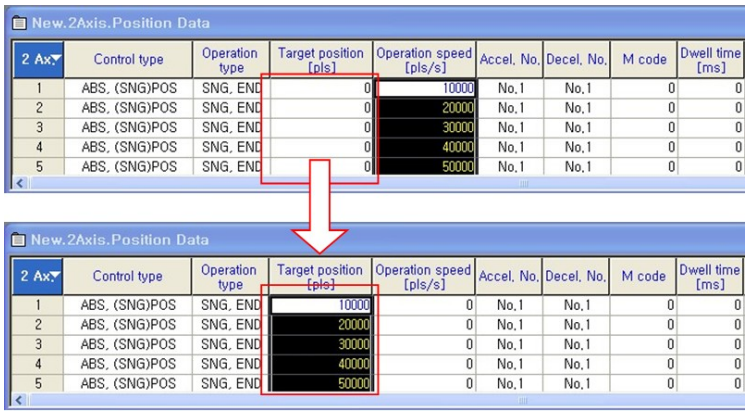
(2) Paste

Paste copied content to selected range.

[Sequence]

1. Select range for Pasteing copied range.
2. Click [Edit]->[Paste].
3. Data is displayed on the selected range.

[Editorial screen]


New.2Axis.Position Data
2 Axis
Control type
Operation type
Target position [pls]
Operation speed [pls/s]
Accel. No.
Decel. No.
M code
Dwell time [ms]
1 ABS, (SNG)POS SNG, END 0 10000 No.1 No.1 0 0
2 ABS, (SNG)POS SNG, END 0 20000 No.1 No.1 0 0
3 ABS, (SNG)POS SNG, END 0 30000 No.1 No.1 0 0
4 ABS, (SNG)POS SNG, END 0 40000 No.1 No.1 0 0
5 ABS, (SNG)POS SNG, END 0 50000 No.1 No.1 0 0
New.2Axis.Position Data
2 Axis
Control type
Operation type
Target position [pls]
Operation speed [pls/s]
Accel. No.
Decel. No.
M code
Dwell time [ms]
1 ABS, (SNG)POS SNG, END 10000 0 No.1 No.1 0 0
2 ABS, (SNG)POS SNG, END 20000 0 No.1 No.1 0 0
3 ABS, (SNG)POS SNG, END 30000 0 No.1 No.1 0 0
4 ABS, (SNG)POS SNG, END 40000 0 No.1 No.1 0 0
5 ABS, (SNG)POS SNG, END 50000 0 No.1 No.1 0 0

11.2.2 Set Value of Initial Data

When user edit Common parameter/Operation parameter/operation data, partially can set initial value.

[Sequence]

1) Select range for setting initial value.
2) Click [Edit]->[Initial value setting].
3) Selected data is set as initial value.

[Edtiorial screen]

New.1Axis.Position Data
1 Axis
Control type
Operation type
Target position [pls]
Operation speed [pls/s]
Accel. No.
Decel. No.
M code
Dwell time [ms]
1 ABS, (SNG)POS SNG, END 100 0 No.1 No.1 0 0
2 ABS, (SNG)POS SNG, END 200 0 No.1 No.1 0 0
3 ABS, (SNG)POS SNG, END 300 0 No.1 No.1 0 0
4 ABS, (SNG)POS SNG, END 400 0 No.1 No.1 0 0
5 ABS, (SNG)POS SNG, END 500 0 No.1 No.1 0 0
6 ABS, (SNG)POS SNG, END 600 0 No.1 No.1 0 0
7 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
New.1Axis.Position Data
1 Axis
Control type
Operation type
Target position [pls]
Operation speed [pls/s]
Accel. No.
Decel. No.
M code
Dwell time [ms]
1 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
2 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
3 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
4 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
5 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
6 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
7 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0

Notes

Initial data value is displayed as black color, not initial data value is displayed as blue color.

11.2.3 Cancel/Restart Edition

When user edits common parameter/operation parameter/operation data, it provides return/restore function.

[Sequence]

1) Edit data.
2) Click [Edit]->[Cancel edit] or [Restart].

Notes

When Set CAM data, do not provides return/restore function.

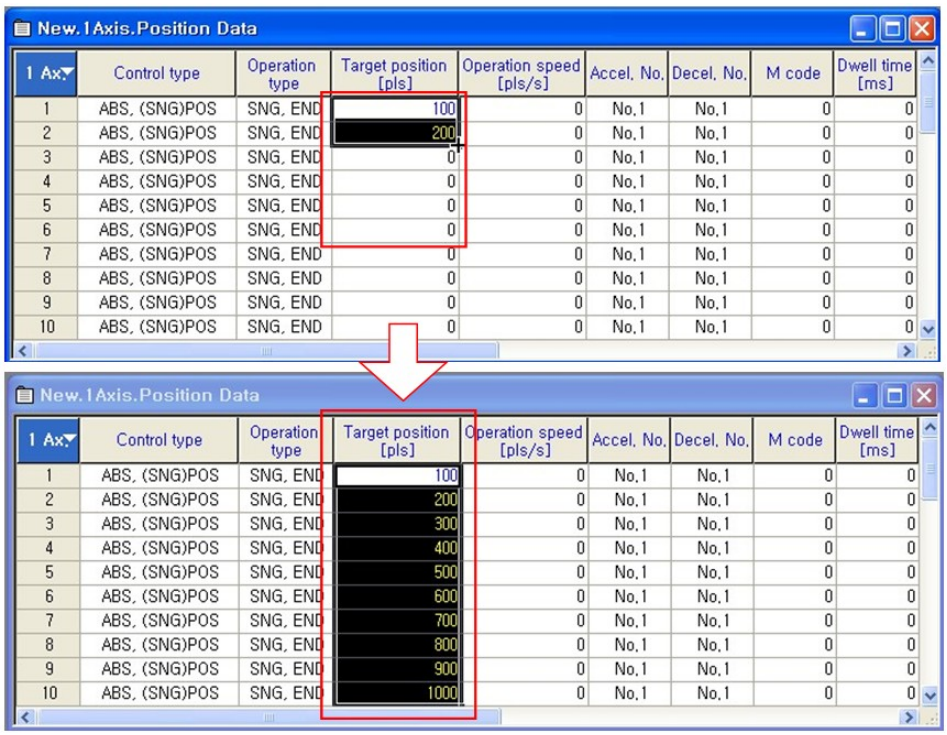
11.2.4 Auto fill

When set operation data, user easily makes progressived data by auto fill function. But, auto fill function only can perform for 1 vertical line.

[SEquence]

1) Set data on screen of the operation data. (Set data over 2.)
2) Set data and move mouse pointer to right top of the last setting data.
3) When mouse pointer change to"+", then drag mouse.
4) Automatically created data is filled in the selected cell.

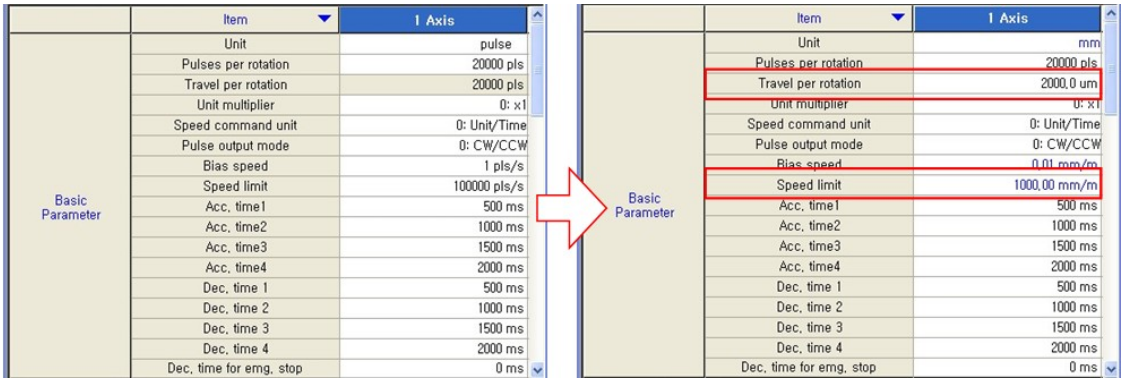
[Edtiorial screen]


New.1Axis.Position Data
1 Ax.
Control type
Operation type
Target position [pls]
Operation speed [pls/s]
Accel. No.
Decel. No.
M code
Dwell time [ms]
1 ABS, (SNG)POS SNG, END 100 0 No.1 No.1 0 0
2 ABS, (SNG)POS SNG, END 200 0 No.1 No.1 0 0
3 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
4 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
5 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
6 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
7 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
8 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
9 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
10 ABS, (SNG)POS SNG, END 0 0 No.1 No.1 0 0
New.1Axis.Position Data
1 Ax.
Control type
Operation type
Target position [pls]
Operation speed [pls/s]
Accel. No.
Decel. No.
M code
Dwell time [ms]
1 ABS, (SNG)POS SNG, END 100 0 No.1 No.1 0 0
2 ABS, (SNG)POS SNG, END 200 0 No.1 No.1 0 0
3 ABS, (SNG)POS SNG, END 300 0 No.1 No.1 0 0
4 ABS, (SNG)POS SNG, END 400 0 No.1 No.1 0 0
5 ABS, (SNG)POS SNG, END 500 0 No.1 No.1 0 0
6 ABS, (SNG)POS SNG, END 600 0 No.1 No.1 0 0
7 ABS, (SNG)POS SNG, END 700 0 No.1 No.1 0 0
8 ABS, (SNG)POS SNG, END 800 0 No.1 No.1 0 0
9 ABS, (SNG)POS SNG, END 900 0 No.1 No.1 0 0
10 ABS, (SNG)POS SNG, END 1000 0 No.1 No.1 0 0

11.2.5 Unit Auto Changing Function

When edit operation parameter, if change each axis unit, unit and range of item about speed and position are automatically change. Following the example describes editorial screen, when unit of axis1 is change to [pulse]->[mm].
And user can edit data without additional operation because operation data of target position/operation speed item are automatically change by changing unit.

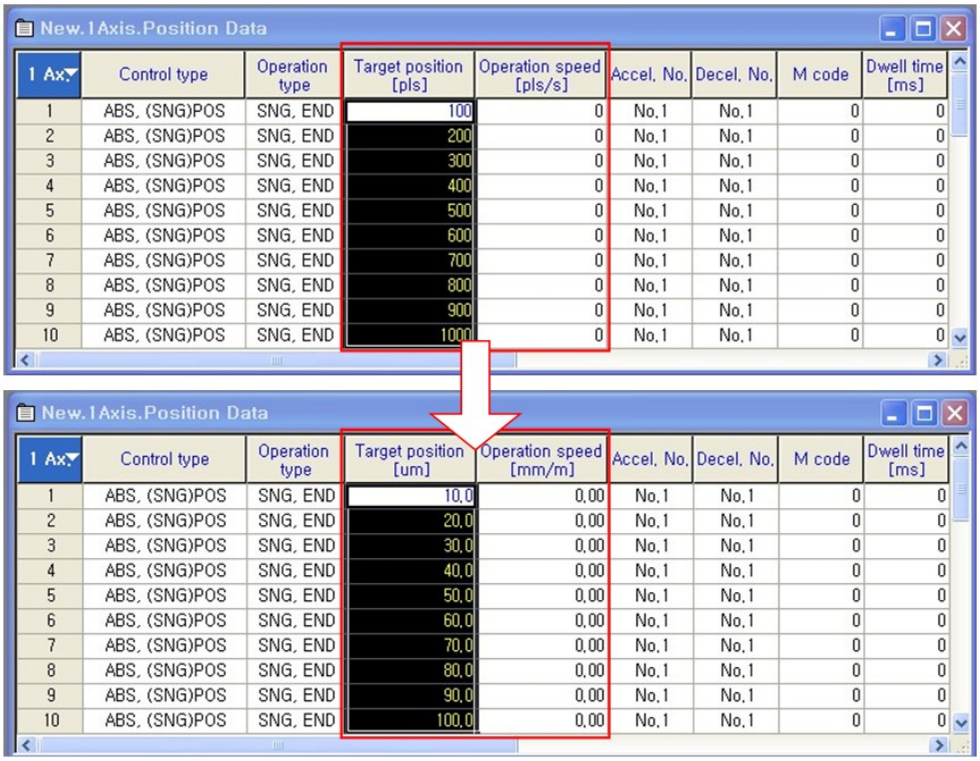
[Operation parameter editorial screen]



	Item	1 Axis
Basic Parameter	Unit	pulse
	Pulses per rotation	20000 pls
	Travel per rotation	20000 pls
	Unit multiplier	0: x1
	Speed command unit	0: Unit/Time
	Pulse output mode	0: CW/CCW
	Bias speed	1 pls/s
	Speed limit	100000 pls/s
	Acc. time1	500 ms
	Acc. time2	1000 ms
	Acc. time3	1500 ms
	Acc. time4	2000 ms
	Dec. time 1	500 ms
	Dec. time 2	1000 ms
	Dec. time 3	1500 ms
	Dec. time 4	2000 ms
	Dec. time for emg. stop	0 ms

	Item	1 Axis
Basic Parameter	Unit	mm
	Pulses per rotation	20000 pls
	Travel per rotation	2000.0 um
	Unit multiplier	0: x1
	Speed command unit	0: Unit/Time
	Pulse output mode	0: CW/CCW
	Bias speed	0.01 mm/m
	Speed limit	1000.00 mm/m
	Acc. time1	500 ms
	Acc. time2	1000 ms
	Acc. time3	1500 ms
	Acc. time4	2000 ms
	Dec. time 1	500 ms
	Dec. time 2	1000 ms
	Dec. time 3	1500 ms
	Dec. time 4	2000 ms
	Dec. time for emg. stop	0 ms

[Operation data editorial screen]



New.1Axis.Position Data

1 Ax.	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS, (SNG)POS	SNG, END	100	0	No.1	No.1	0	0
2	ABS, (SNG)POS	SNG, END	200	0	No.1	No.1	0	0
3	ABS, (SNG)POS	SNG, END	300	0	No.1	No.1	0	0
4	ABS, (SNG)POS	SNG, END	400	0	No.1	No.1	0	0
5	ABS, (SNG)POS	SNG, END	500	0	No.1	No.1	0	0
6	ABS, (SNG)POS	SNG, END	600	0	No.1	No.1	0	0
7	ABS, (SNG)POS	SNG, END	700	0	No.1	No.1	0	0
8	ABS, (SNG)POS	SNG, END	800	0	No.1	No.1	0	0
9	ABS, (SNG)POS	SNG, END	900	0	No.1	No.1	0	0
10	ABS, (SNG)POS	SNG, END	1000	0	No.1	No.1	0	0

New.1Axis.Position Data

1 Ax.	Control type	Operation type	Target position [um]	Operation speed [mm/m]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS, (SNG)POS	SNG, END	10.0	0.00	No.1	No.1	0	0
2	ABS, (SNG)POS	SNG, END	20.0	0.00	No.1	No.1	0	0
3	ABS, (SNG)POS	SNG, END	30.0	0.00	No.1	No.1	0	0
4	ABS, (SNG)POS	SNG, END	40.0	0.00	No.1	No.1	0	0
5	ABS, (SNG)POS	SNG, END	50.0	0.00	No.1	No.1	0	0
6	ABS, (SNG)POS	SNG, END	60.0	0.00	No.1	No.1	0	0
7	ABS, (SNG)POS	SNG, END	70.0	0.00	No.1	No.1	0	0
8	ABS, (SNG)POS	SNG, END	80.0	0.00	No.1	No.1	0	0
9	ABS, (SNG)POS	SNG, END	90.0	0.00	No.1	No.1	0	0
10	ABS, (SNG)POS	SNG, END	100.0	0.00	No.1	No.1	0	0

11.3 Copy Data

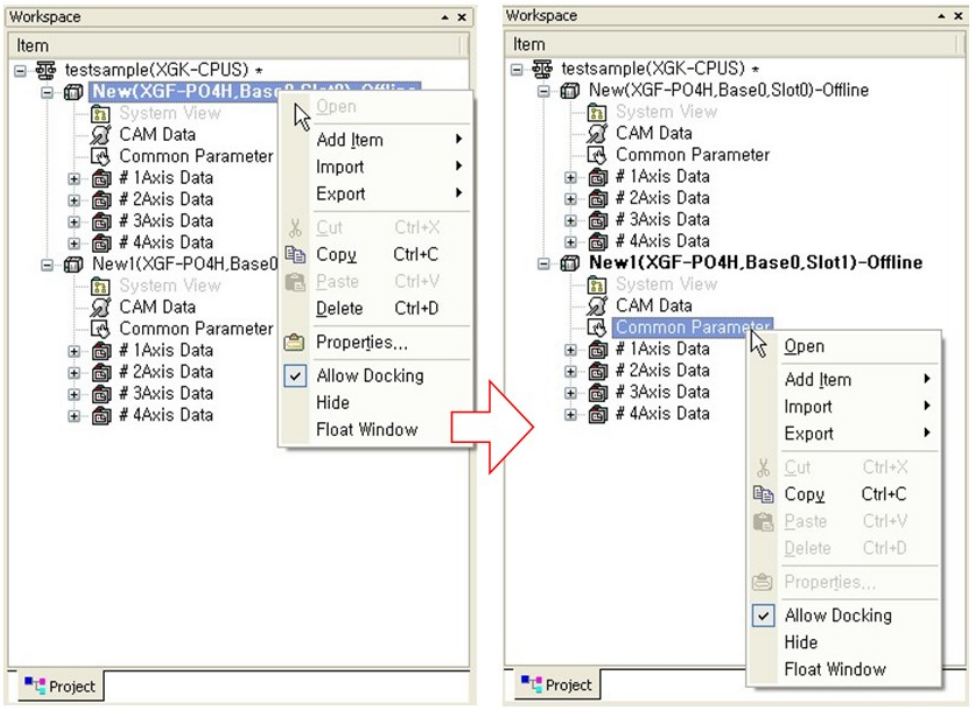
XG-PM provides useful data copy function when edit data item with XG-PM. Also provides not only copying each data item but copying each axis, copying module unit.

11.3.1 Copy for Each Data Item

[Sequence]

1) Select item for copying data on the project tree.
2) Proceed [Edit]->[Copy] after click mouse right button.
3) Select item for Pasteing data on the project tree.
4) Proceed [Edit]->[Paste] after click mouse right button.

[Copy common parameter]



Notes

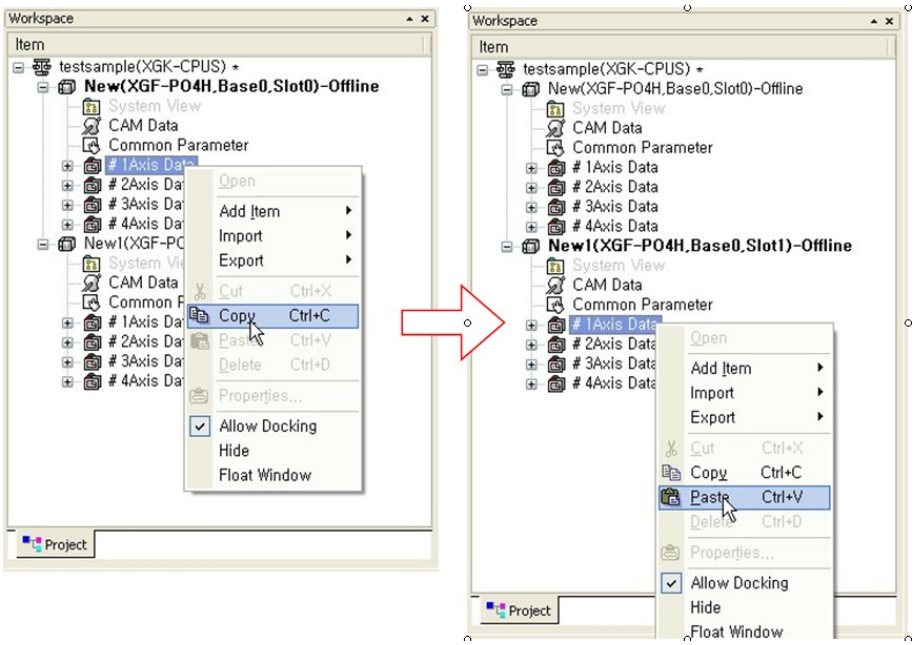
Perform copy for each item to CAM data/Common parameter/Operation data/Operation parameter.

11.3.2 Copy for Each Axis Data

[Sequence]

1) Select item on the project tree.
2) Proceed [Edit]->[Copy] after click mouse right button.
3) Select item on the project tree for Pasteing.
4) Proceed [Edit]->[Paste] after click mouse right button.

[Copy axis data]



Notes

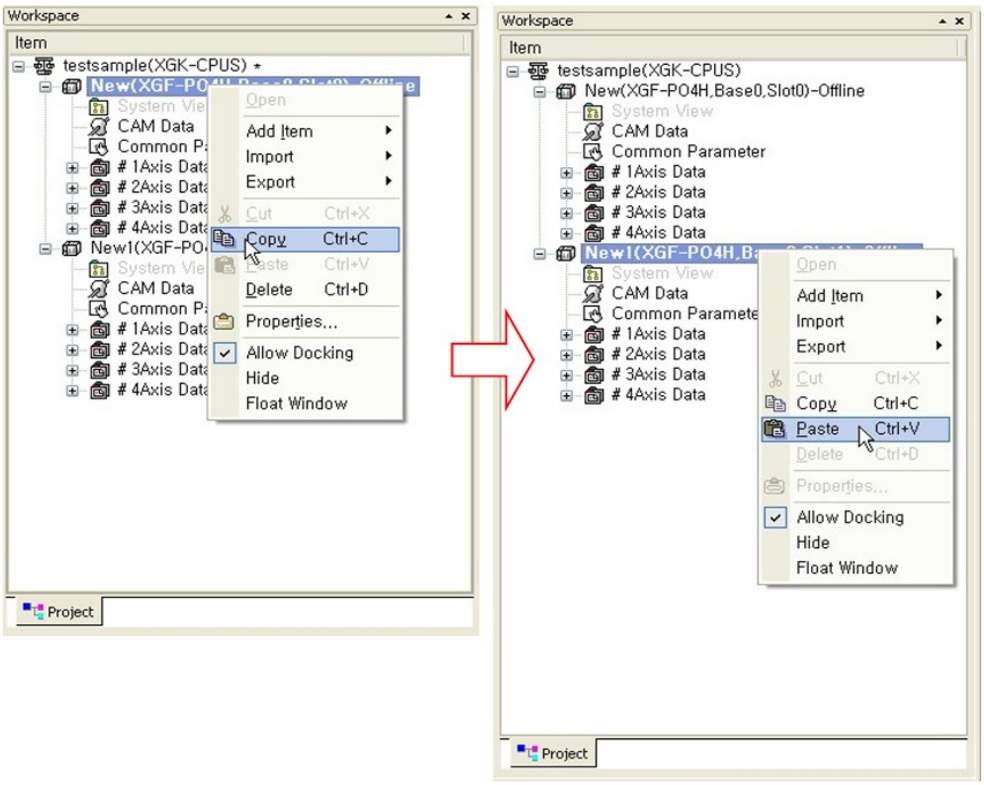
When copy axis unit data, both Operation data/Operation parameter data is copied.

11.3.3 Copy Data for Each Module

[Sequence]

1) Select module item on the project tree.
2) Proceed [Edit]->[Copy] after click mouse right button.
3) Select module item from project tree for Paste.
4) Proceed [Edit]->[Paste] after click mouse right button.

[Copy module unit]



Notes

When copy module unit data, copy all CAM data/Common parameter and operation data from axis 1 to axis 4/Operation parameter item data.

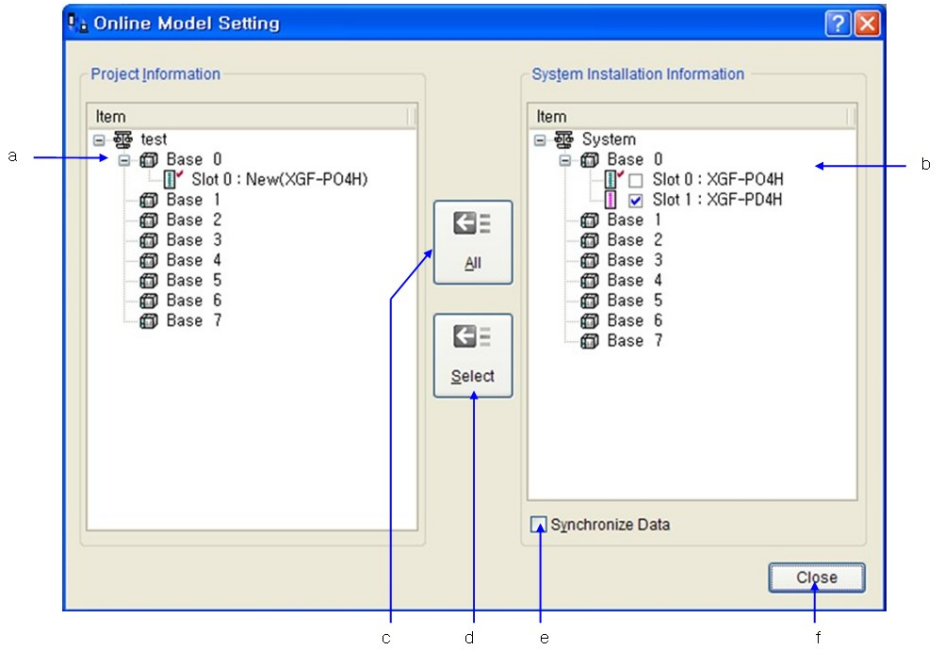
11.4 Online Model Setting

Online model setting function provides solution that it set onlined module on the current project and data which it is onlined on the module is made synchronize for fast and convenient method.

[Sequence]

1) Create project.
2) Connect with PLC by [Online]->[Connect].
3) Proceed [Online]->[Online model setting].

[Communication box]



[Communication box description]

a. Project information: Display set module information on the current.
b. System installation information: Display equipped positioning module information.
c. All: Perform equipped entire positioning module for setting.
d. Select: Selected positioning module make perform for setting on the project module.
e. Synchronize data: Renew data by read data from equipped positioning module data.
f. Close: End communication box.

11.4.1 Module Synchro Function

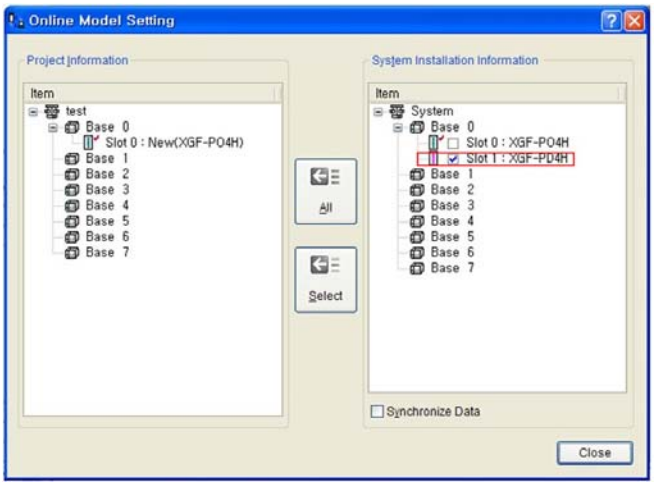
Module synchronize function recognize positioning module which it is exist on the PLC system and set that on the project.

(1) Synchro of Select Module

[Sequence]

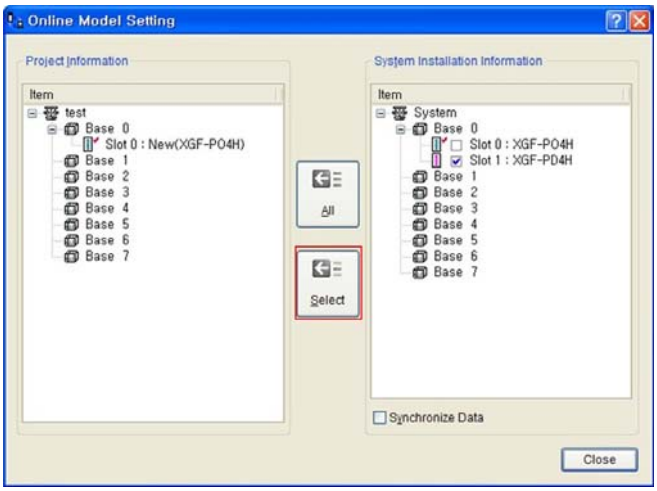
1) Create project.
2) Connect to PLC by [Online]->[Connect].
3) Proceed [Online]->[Online model setting].
4) Select module for synchronizing on online model setting communication box system equipment information window.

[Communication box]



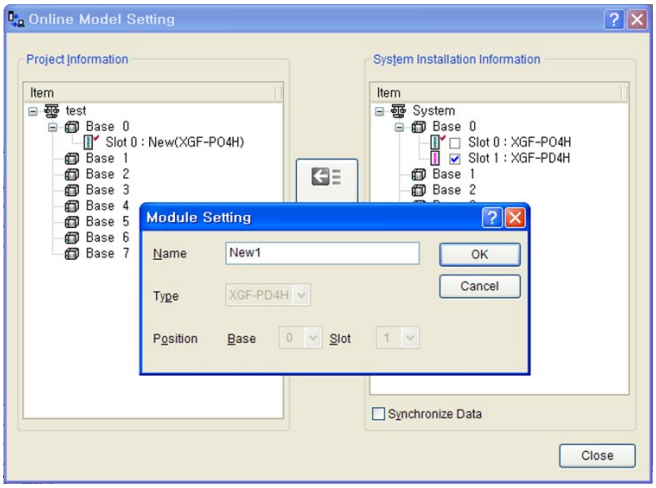
5) Click the select button for module synchronize.

[Communication box]



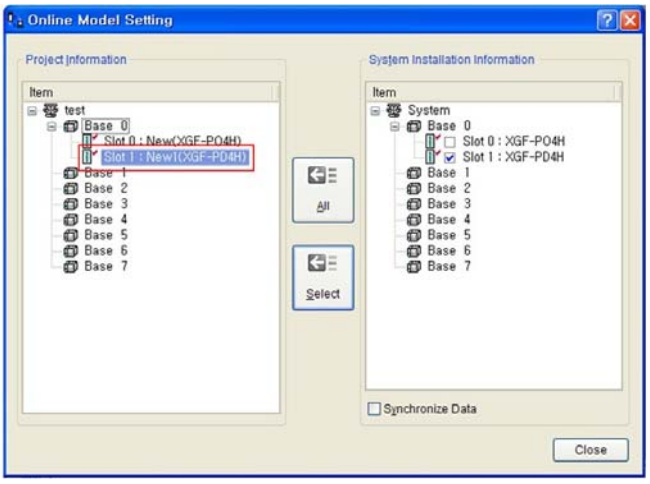
6) Set module name that it is need to synchronize and confirm.

[Communication box]



7) Confirm set module on the project.

[Communication box]



Notes

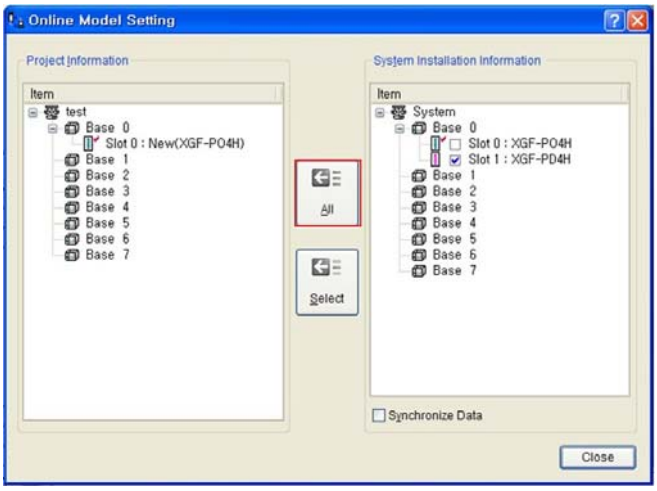
Module is automatically added to project tree when module is set on the project information after module synchronize.

(2) Synchro of whole module

[Sequence]

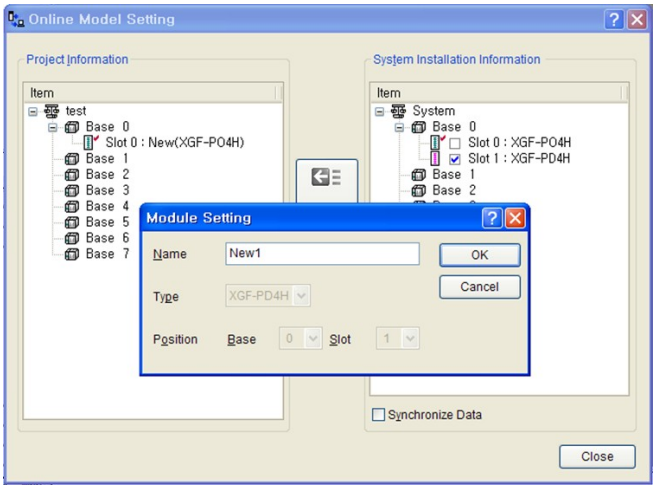
1) Create project.
2) Connect to PlC by proceeding [Online]->[connection].
3) Proceed menu [Online]->[online model setting].
4) Click Entire button for module synchronize.

[Communication box]



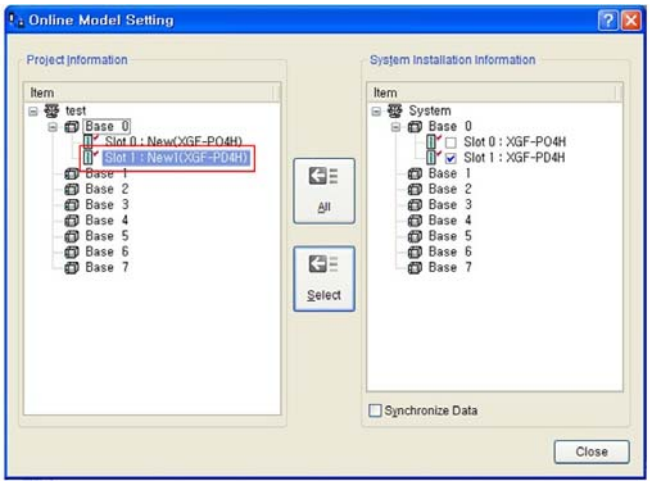
5) Set the module name for synchronize on module setting communication box and click.
(Then module communication box is revitalized as much as the number of module, set the each module name for each module.)

[Communication box]



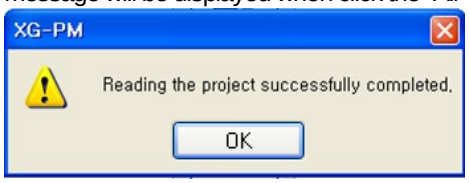
6. Confirm set module on the project.

[Communication box]



Notes

This message will be displayed when click the “All” or “select” button after synchronizeronizing entire module.



11.4.2 Data Synchro Function

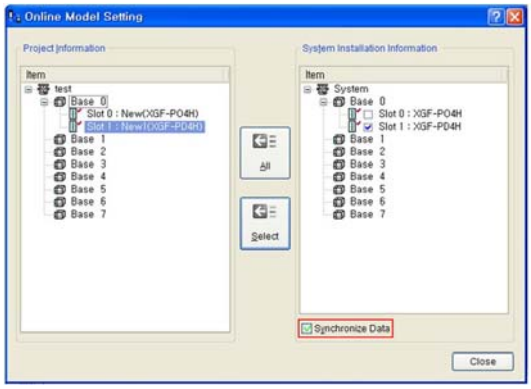
Provide setting function by read module data from PLC system.

(1) Data synch of selecting module

[Sequence]

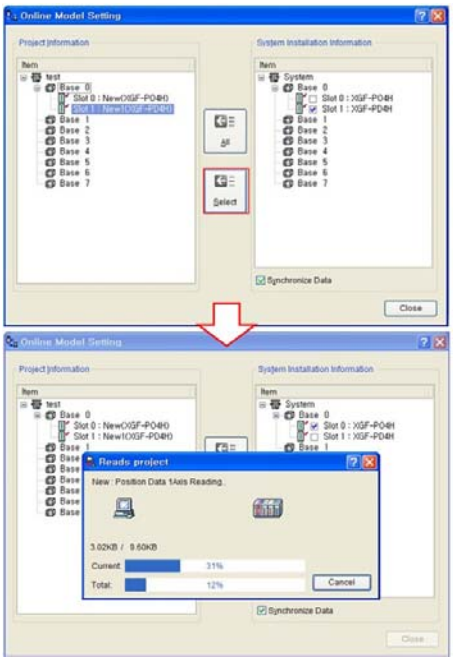
1. Create project.
2. Connect to PLC by menu [Online]->[Connection].
3. Proceed menu [Online]->[Online model setting].
4. Select module for synchronize on the online model setting communication box system equipment information window.
5. Check data synchronize item.

[Communication box]



6. Begin to read data from module when click the select button.

[Communication box]



Notes

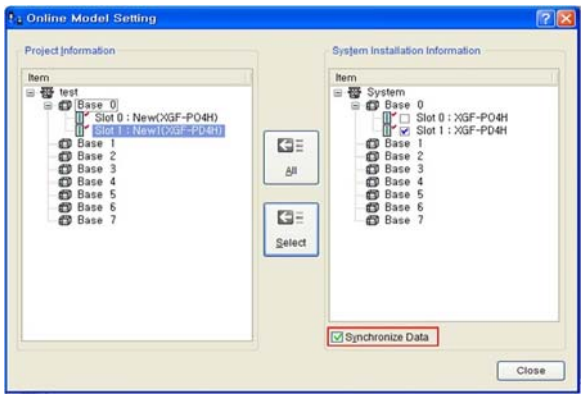
When proceed module synchronize function, if check data synchronize item, then proceed module synchronize and data synchronize at the same time.

(2) Data synch of whole module

[Sequence]

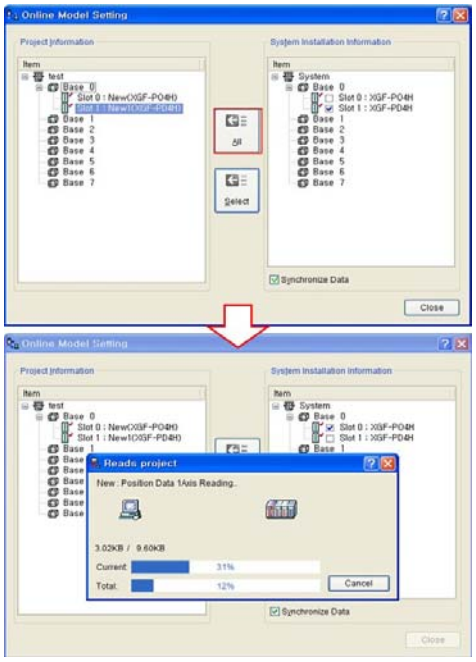
1. Create project.
2. Connect to PLC by proceeding [Online]->[Connection].
3. Proceed [Online]->[Online model setting].
4. Check data synchronize item.

[Communication box]



5. Read data from module by click the selecting button.

[Communication box]



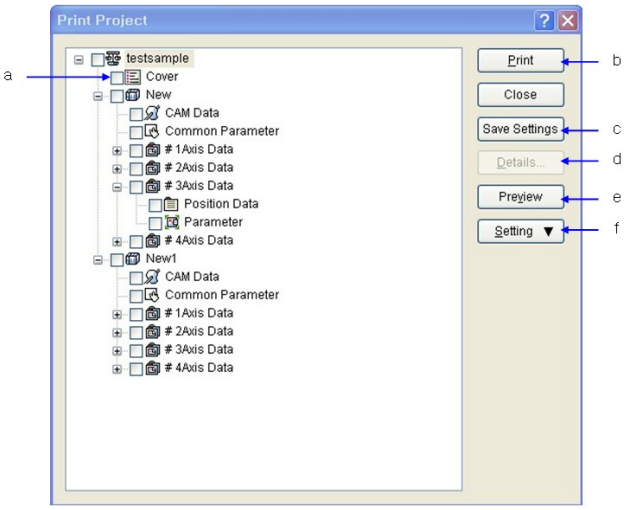
11.5 Project Printing

XG-PM provides project printing function for printing entire data which user set at once. These functions progressively print all contents of project. It performs setting item when it is selecting/printing, preview function, printing function.

[Sequence]

1) Proceed menu [Project]->[Project printing].
2) Project printing communication box is appeared.
3) Set item what user need to print.

[Communication box]



[Communication box description]

a) Project tree: Express tree structure which it can print on the project.
b) Print button: Print checked item on the project tree.
c) Save settings: Can save selected item at the project tree.
d) Details: Set details selected item on the project tree.
e) Preview: Provides preview function what it was checked on the project tree.
f) Setting: Set entire printing. For example, set process printer setting, printing page setting, space setting, etc.

Notes

Detail button is revitalized only, when selected current item is [Cover].

11.5.1 Printing setting

Set paper and print.

[Sequence]

1) Click setting button on the project printing communication box or click mouse right button on the project tree.

[Communicarion box]

[Communication box description]

a) Detail: To be revitalized when select cover setting item, detail setting is possible to [Cover].
b) Page setting: Can set paper setting for printing.
c) Header/Footer: Can input header and footer.

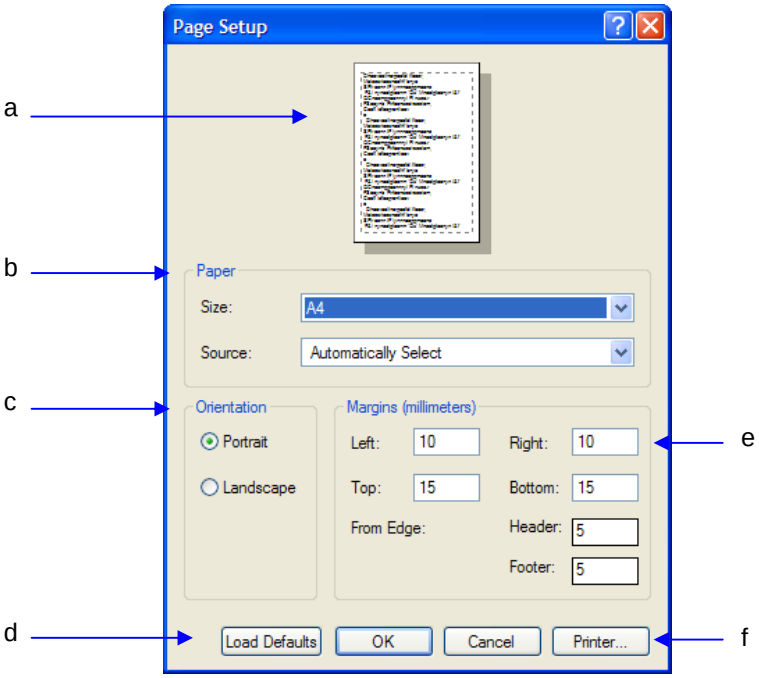
11.5.2 Space Setting

Set space for printing paper.

[Sequence]

1) Execute page setting menu after click the setting button on the project printing communication box or click mouse right button on the project tree.

[Communication box]



[Communication box description]

a) Preview: Can preview layout of selected paper space.
b) Paper: Select printing paper.
c) Direction: Select printing direction of paper.
d) Default value restore button: Change contents of space, header, footer as default when it is installed.
e) Space setting: Set space of printing paper.
f) Printer: Can change printer setting.

Notes

1. When print contents should be careful that it is overlap with header/footer.
2. Can not be printed without setting header/footer contents.

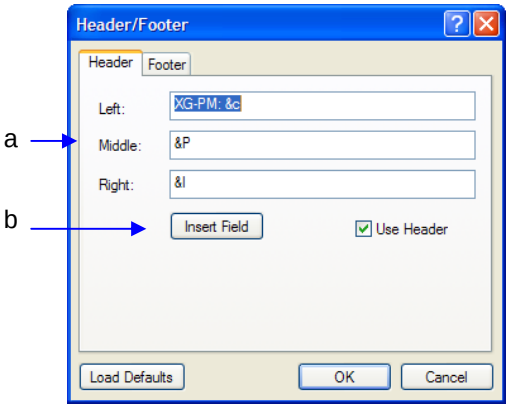
11.5.3 Header/Footer Setting

Set contents of header/footer.

[Sequence]

1) Set header/footer with setting button on the project printing communication box or header/footer setting menu on the project tree.

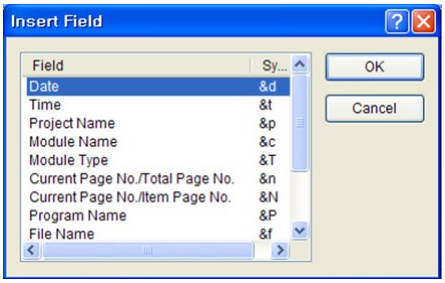
[Communication box]



[Communication box description]

a) Explain content: Input contents on the left/center/light of header/footer.

b) Field interpolation button: Field is interpolated to current cursor position (editing box; left, center, right).



Notes

1. It is possible that it set header/footer by input of user and field.
   Ex) Input header/footer as"Today is the &d."
   It will be printed as "Today is june 1, 2007."

2. Field contents
   (1) Date: Print as "&d-> yyyy-mm-dd".
   (2) Time: Print as "&t -> hh:mm:ss".
   (3) Project name: &p
   (4) Module name: &c
   (5) Module type: &T
   (6) Current page No./the number of entire page: &n -> Current No./The number of entire page of selected item.
   (7) File name: &f -> Current project file name.
   (8) File name that it is included route: &F -> It is displayed as directory route name that file name is included.
   (9) Project description: &C -> Print project description.

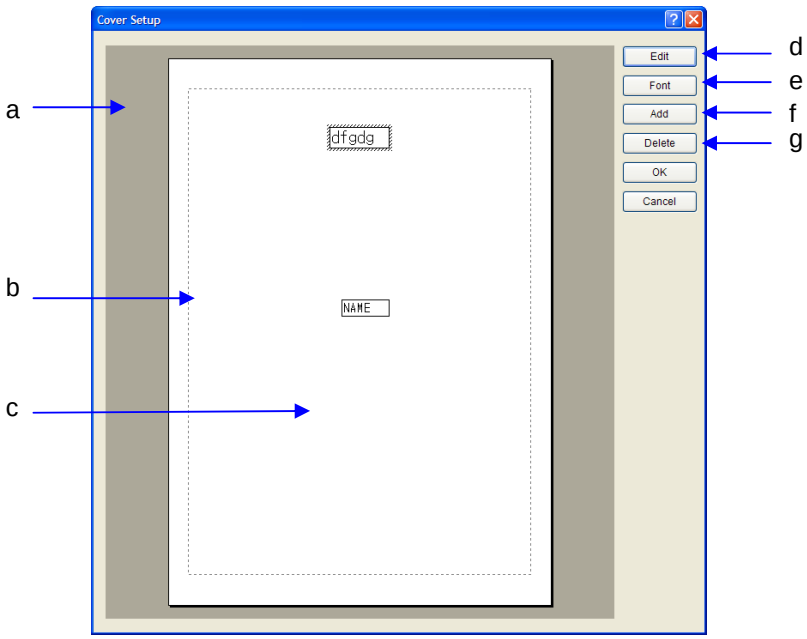
11.5.4 Cover Printing Setting

It is possible that it set printing cover.

[Sequence]

1) Select cover on the project tree of printing communication box.
2) Click the detail button or click enter key while select cover.

[Communication box]

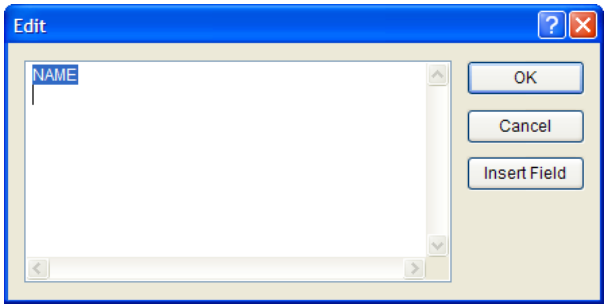


[Communication box description]

1) Cover paper: Basically A4 vertical direction. It depends on paper setting.
2) Margin indication: Set margin is displayed by dotted line.
3) Editorial box: That is preview. Content, Font, Position can be changed.
4) Editorial button: Content of editorial box can be changed.
5) Font button: It is possible that font of selected editorial box change.
6) Addition: Can add new editorial box of cover page.
7) Delete: Can delete selected editorial box.

[Add contents sequence]

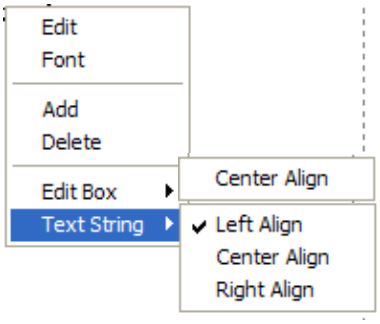
1) Click the [Add] button.
2) Mouse pointer move to paper.
3) Mouse pointer change to next.
4) Click the paper by mouse left button.
5) Editorial communication box is appeared.



6) In case of ending after edition, mouse cursor change to arrow.

Notes

1. Can line up editorial box in the paper and editorial box.
   - By mouse right button with menu.



(1) [Editorial box]-[Center]: Center selected editorial box.
(2) [String]-[Align left]: Contents is arraied to left side on the editorial box.
(3) No print frame of editorial box during printing.
(4) It is possible that move editorial box by arrow key.
(5) No provides cancel edition(Undo) and restart.
Display real contents of field with preview, if the sentence includes field. When editing, display field.

11.6 Trend monitor

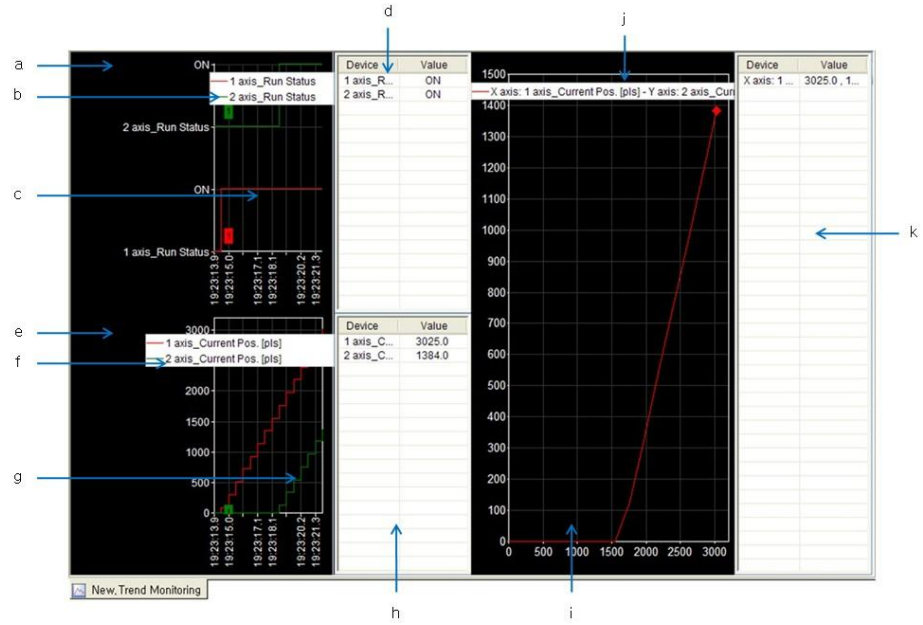
Trend monitor read data from module with online and display graph. Trend monitor window compose by bit graph, trend graph, XY graph.
Bit graph: Display On/Off of bit type device by step graph.
Trend graph: Word type device value change to selected device type and display changing. Trend graph display changing value by device value change to changed data type.

11.6.1 Begin to Trend Monitor

[Sequence]

1) Online module.
2) Proceed menu [Monitoring]->[Trend monitoring].

[Trend monitoring window]



[Trend monitor window description]

a) Bit graph: Display bit device data.
b) Bit graph index: Display bit device name and graph color.
c) Display bit graph current step: Display step No. while it is operating axis of included set device.
d) Bit graph current value: Display current value of bit device.
e) Trend graph: Display data of word device.
f) Trend graph index: Display trend graph name and graph color.
g) Display trend graph current step: Display step No. while it is operating axis of included set device.
h) Current value of trend graph: Display current value of trend device.
i) XY graph: Display word device data by two-dimension graph.
j) XY graph index: Display XY device name and graph color.
k) XY graph current value: Current value of XY device display by two-dimension.

Notes

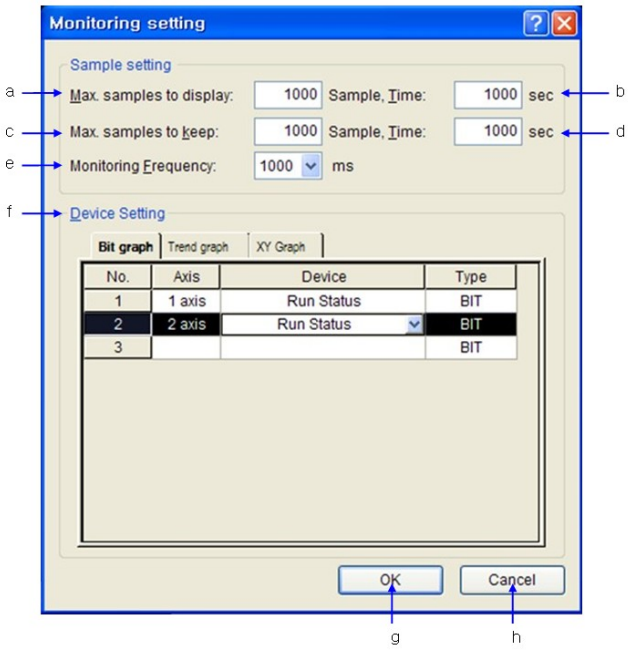
The data which is displayed on the trend monitor can be different with real data. If you want to monitor correct timing, then use data trace function.
Refer to this manual 11.8 for data trace function.

11.6.2 Trend Monitor Setting

[Sequence]

1) Proceed menu [Graph]-[Trend device setting].

[Communication box]

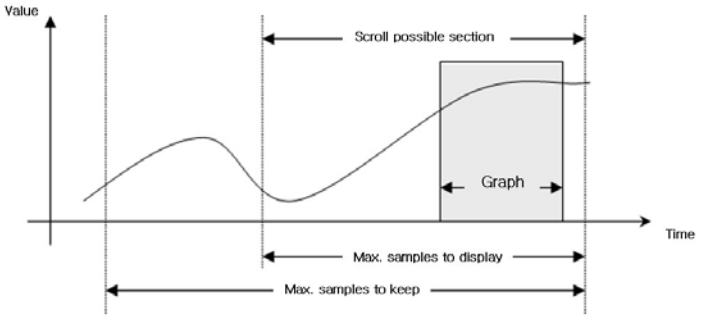


[Communication box description]

a) Max. samples to display: Display the number of scrollable maximum sample on the graph.
b) Sample. time: Display maximum display sample for each monitoring cycle.
c) Max. samples to keep: Display the number of maximum sample which it can save as file.
d) Sample. time: Display maximum samples to keep for each monitoring cycle.
e) Monitoring Frequency: Set cycle which it read data from module. If the cycle is more short, the data more correct, can give effect to efficiency of PLC scan and PC.
f) Device setting: Set device for monitoring.
g) OK: Apply changes and close the communication box.
h) Cancel: Close the communication box.

Notes

1. Maximum display sample can't bigger than maximum sustain sample.
2. Maximum display time can't bigger than maximum sustain time.
3. "Graph" is graph range which is displayed on the current screen, can horizontally scroll as much as the number of maximum display sample.
4. Maximum sustain sample is the number of maximum sample which it can be saved. Refer to this manual 6.4.3 file for saving item as file.



(1) Bit graph setting

Input bit device for monitoring.

[Sequence]

1) Select bit graph tab on the trend device setting communication box.
2) Input device of bit type.

(2) Trend graph setting

Input trend device for monitoring.

[Sequence]

1) Select trend graph tab on the trend device setting communication box.
2) Input device of word type.

Notes

1. Can registrate total 8 devices with bit device and trend device.
2. The setting of data type depends on device, set to BIT, WORD, DWORD type.

(3) XY graph setting

Input XY device for monitoring.

[Sequence]

1) Select XY graph tab on the trend device setting communication box.
2) Input axis X device and axis Y device.

Notes

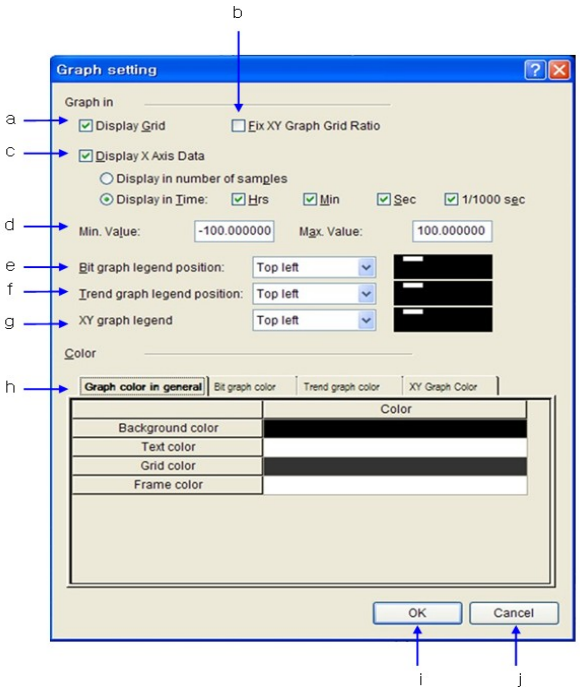
1. Need to device setting for registration of axis X device and axis Y device on the XY graph.
2. Axis X/Y device can select only one device which is set on the trend graph tab.

11.6.3 Graph Setting

[Sequence]

1) Proceed menu [Graph]-[Graph setting].

[Communication box]

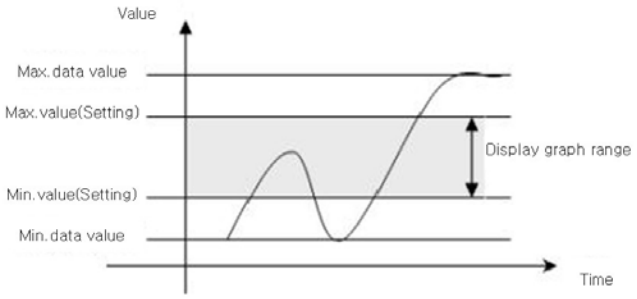


[Communication box description]

a) Display Grid: Set displaying XY grid on the screen.
b) Fix XY graph grid ratio: Set grid option of XY graph. (When check, horizontal/vertical grid rate should be same.)
c) Display X Axis data: Set available display data and display method
d) Min/Max value: Set min/max range of graph.

Notes

1. Max/Min values only apply to axis Y of trend graph. But if current axis Y view is auto alignment, then can not be applied.
2. Inputted minimum value smaller than maximum value.
3. If display min/max value range of real data and min/max value range of set graph is as following: The range of grey color is displayed by graph only.

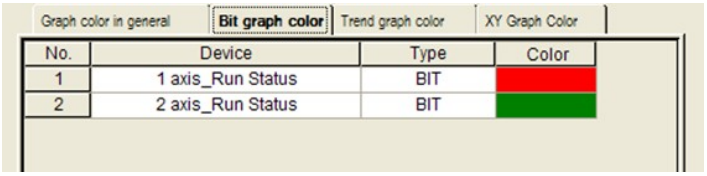


e) Bit graph legend position: Set index position of bit graph.
f) Trend graph legend position: Set trend graph index position.
g) XY graph legend: Set position of XY setting graph.
h) Color setting: Set device color of each graph.
i) OK: Close communication box after applying changing.
j) Cancel: Close communication box.

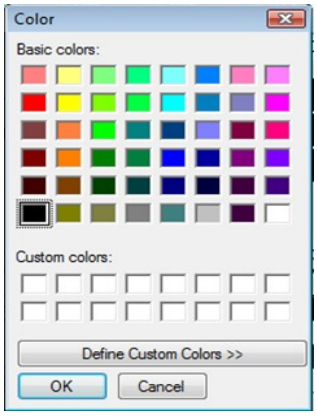
(1) Graph Color Setting Method

[Sequence]

1) Select device for changing color.



2) Click color line. Communicator be display with clicking color line. Confirm after select color.



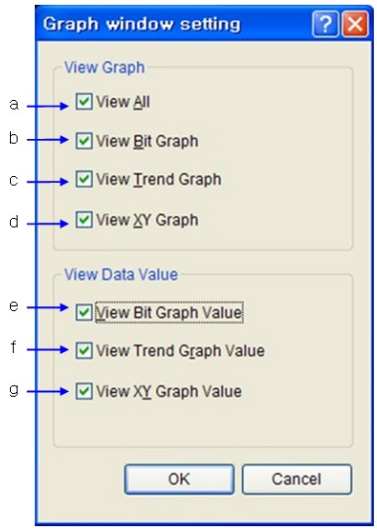
11.6.4 Setting Graph Window

Setting display graph view changing option and data value or not.

[Sequence]

1) Select menu [Graph]-[Screen setting].

[Communication box]



[Communication box description]

a) View all: Display Bit, Trend, XY graph.
b) View bit graph: Display bit graph.
c) View trend graph: Display trend graph only.
d) View XY graph: Display XY graph.
e) View bit graph value: Display bit graph value.
f) View trend graph value: Display trend graph value.
g) View XY graph value: Display XY graph.

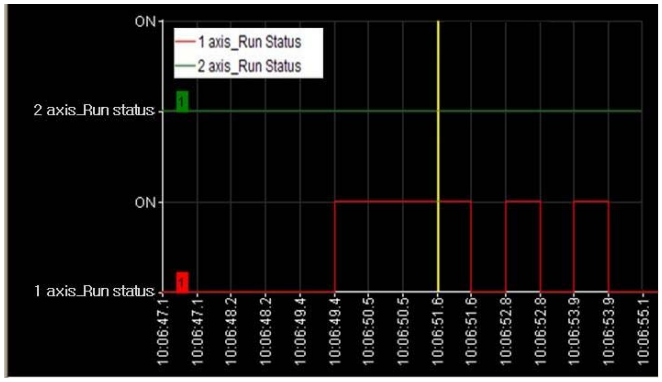
11.6.5 Graph Function

(1) Show Cursor

Display data value of mouse position on the graph.

[Sequence]

1) Proceed menu [Graph]->[Show cursor].
2) Select graph with mouse left button. According to mouse pointer, data is displayed.



Notes

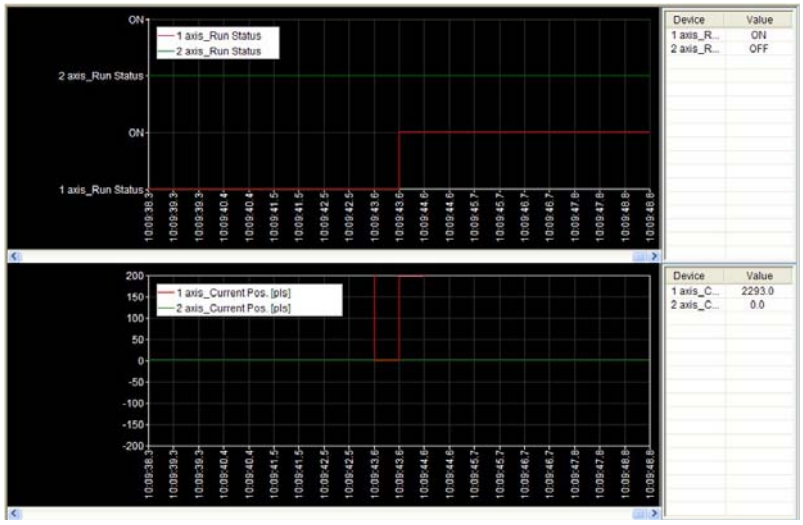
Show cursor function revitalize only when monitor/trend monitor is ended.

(2) Scroll synchro

Set that synchronize time axis of bit graph and trend graph or not. This is useful for monitoring bit graph data and trend graph at the same time.

[Sequence]

1) Proceed menu [Graph]->[Scroll synchro].
2) Move horizontal bar. Bit graph and trend graph are scrolled by setting scroll synchro or not.

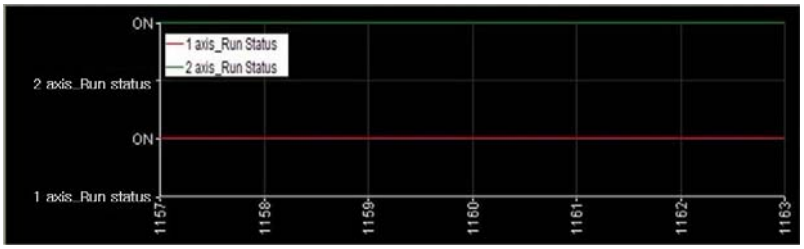


(3) Magnification control of axis X

Control magnification of axis X.

[Sequence]

1) Proceed menu [Graph]->[Expansion of axis X], [reduction of axis X], [as original axis X]. Time interval of axis X is expansed or reducted by selected item.

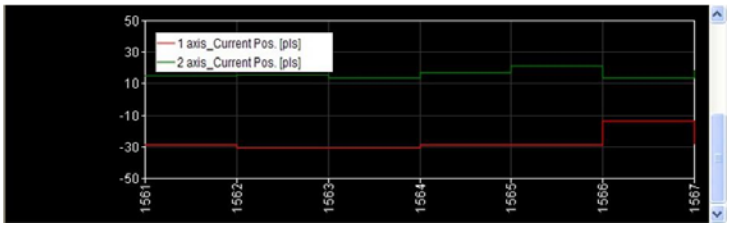


(4) Magnification control of axis Y

Control magnification axis Y.

[Sequence]

1) Proceed menu [Graph]->[Expansion of axis Y], [reduction of axis Y], [as original axis Y]. Time interval of axis Y is expansed or reducted by selected item.

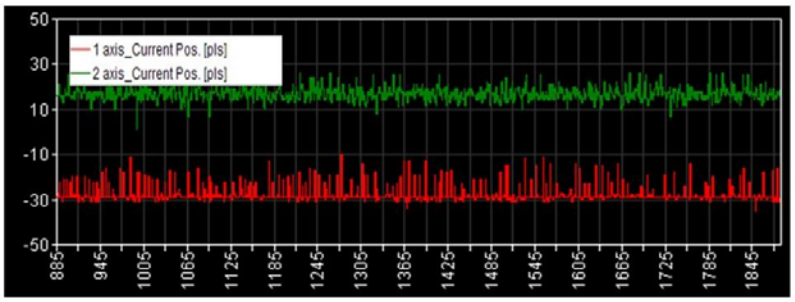


(5) Auto align of axis X

Set auto align of axis X or not. Horizontal scroll bar is disappeard after auto aligns and whole data can show at once.

[Sequence]

1) Proceed menu [Graph]->[Auto align axis X].



(6) Auto align axis Y

Set auto align of axis Y or not. Axis Y auto align only apply to trend graph.

[Sequence]

1) Proceed [Graph]->[Auto align of Axis Y].

Notes

Trend graph is displayed by min/max value which is set unless auto align of axis Y.

(7) Save bitmap

Save graph on the current screen as bitmap file.

[Sequence]

1) Proceed menu [Graph]->[Save bitmap].
2) Confirm button after saving file.

(8) Save text

Save graph data as text file. Samples are saved as the number of set maximum sustained samples.

[Sequence]

1) Proceed menu [Graph]->[Save text].
2) Confirm button after inputting save file name.

Notes

Use .CSV format of excel for saving text file.

(9) Copy Clipboard

Copy present graph to window clip board.

[Sequence]

1) Proceed menu [Graph]->[Copy clipboard].

11.7 Data Trace

Set device for trace and trace codition on module. When it satisfies condition, collect data from module. Display data that it is read from module by graph on XG-PM. This function is similar with trend monitor (This manual 11.7), can collect accurate data, because can collect interval of max module scan.

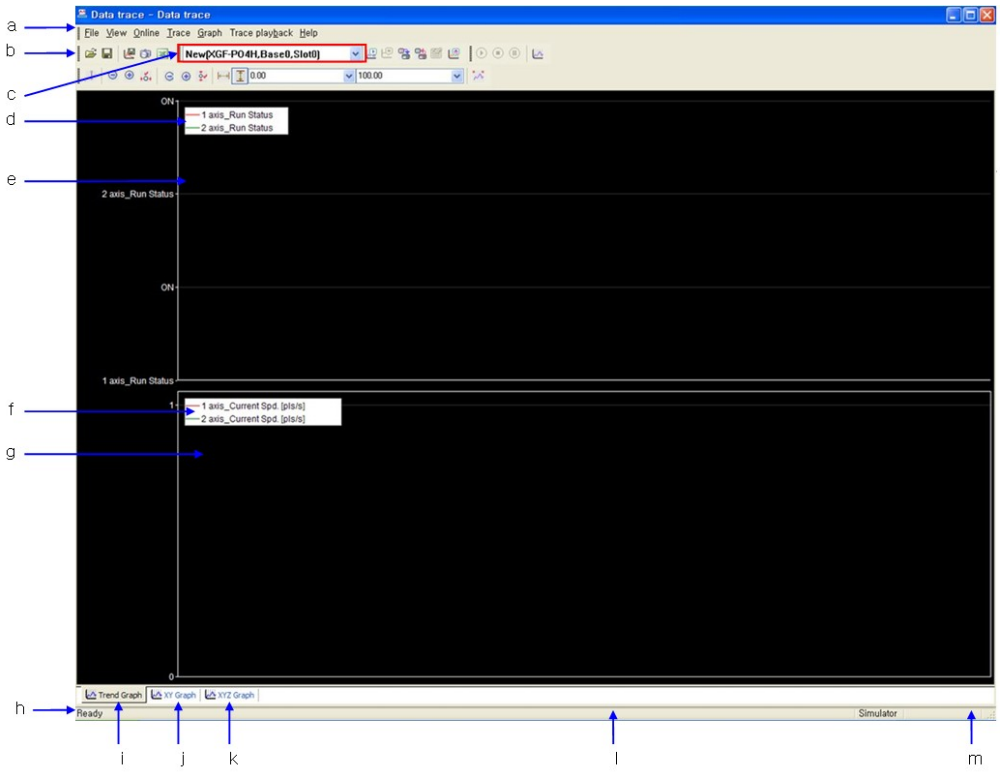
This is sequence for data trace.

Sequence	Contents
Ready	Connect with module.
Setting trace	Set whether to allow trace and set trigger, sample attribute, trace device. Refer to this manual 11.7.2 for detail.
Write setting on the module	Record to module about trace setting item. Refer to 1) Write to trace setting of this manual 11.7.8 for detail.
Start to trace	Start to trace. Start automatically by set trigger condition or select manual trace. Refer to 11.7.2 for trace setting, refer to 11.7.8 for manual trace.
Read data	Read trace data from module. Refer to 11.7.8 for 3) Read trace.
Operating graph (Data analysis)	Refer to 11.7.9 for detail.

[Sequence]

1) Proceed menu [Monitoring]->[Data trace].

[Data trace screen]



[Data trace setting screen]

a) Menu: Display data trace menu.
b) Instrument collection: View bit graph : Display bit graph.
c) Select trace setting module: Select trace setting data module.
d) Bit graph index: Display bit device and graph color.
e) Bit graph: Display bit device and data.
f) Word graph index: Display word device and graph color.
g) Word graph: Display word device data.
h) State bar: Display state of data trace.
i) Trend graph tab: Display bit device and word device trace data on a screen.
j) XY graph tab: Axis X and Y set device and display circle data by 3D data.
k) XYZ graph tab: Axis X,Y,Z set device and display circle data by 3D data.
l) Progress bar: Display progress state, if read data from module.
m) Trace state: Display trace state of module.

11.7.1 Connection

[Sequence]

1) Proceed menu [Online]->[Connect].

Notes

When proceed XG-PM [Monitoring]->[Data trace], automatically proceed [Online]->[Connect].

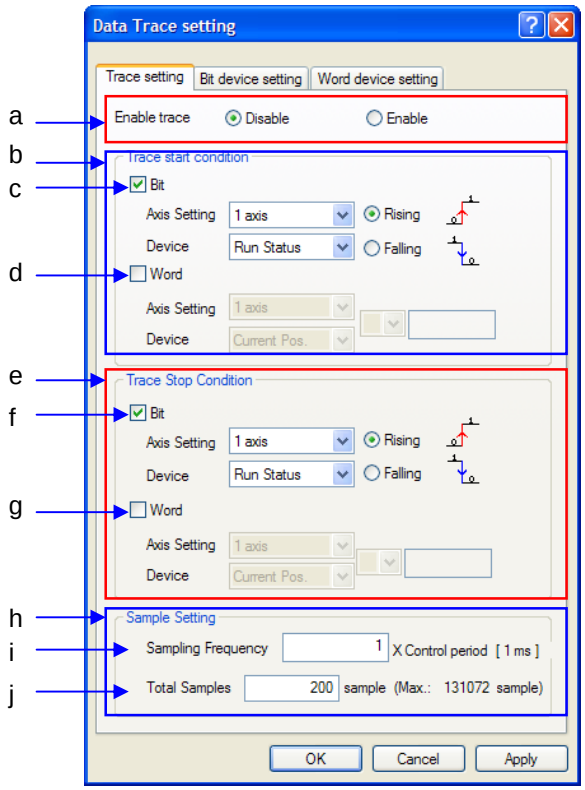
11.7.2 Trace setting

Set trace condition and trace device.

[Sequence]

1) Data trace menu [Trace]->[Trace setting].

[Communication box]



[Communication box description]

a) Permit trace: Set trace permission or not.
b) Trace start condition: Set trace starting condition. Can select bit condition and word condition.
c) Trace start condition (bit): Decides whether setting bit trigger condition or not and set device for watching bit trigger condition.
d) Trace start condition (word): Decides whether setting word trigger condition or not and set device for watching word trigger condition.
e) Trace stop condition: Set trace stop condition. Can select bit condition or word condition.

f) Trace stop condition (bit): Decides whether bit trigger condition or not, set device for watching bit trigger condition.
g) Trace stop condition (word): Decides whether setting word trigger condition or not and set device for watching word trigger condition.
h) Sample setting: The number of data trace samples and set sampling periods.
i) Sampling Frequency : Set data collection cycle. Can set maximum 131072 by multiple of scan periods.
j) Total samples: Set the number of samples for collection. The number of total samples is decided by sample device.
k) OK : Save changed item and close the communication box. If the module is onlined, current setting data automatically write to module.
l) Cancel: Close communication.

(1) Bit trigger setting (Trace starting condition and stop condition common)

Use changing device value as trigger condition.

[Sequence]

1) Select bit condition check box.
2) Select device for bit condition. (Axis setting and device setting)
3) Set trigger condition. Can select rise or fall as trigger condition. (Rise: device value change to 1 from 0, Fall: Device value change to 0 from 1)

(2) Word trigger setting (Trace starting condition and stop condition common)

Use changing word device value as trigger condition.

[Sequence]

1) Select word condition check box.
2) Select device for word condition. (Axis setting and device setting)
3) Input constant that it is compared with word device.
4) Select condition that it is compared with inputted constant.
   Available select function is as follows:.
   <(Small), <= (Small or equal), ==(equal), >=(Big or equal), >(Big)

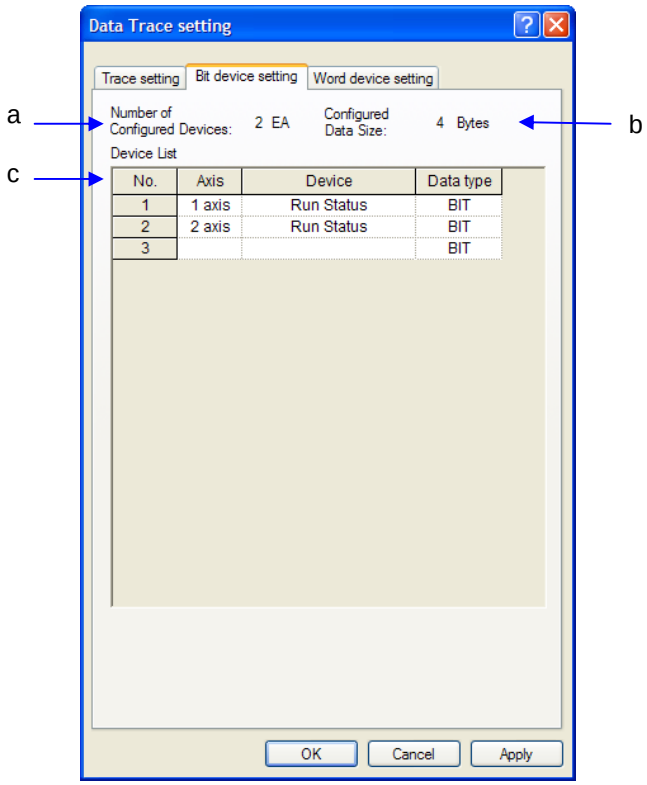
(3) Bit device setting

Select bit device for collecting data. Bit device display selected device.

[Sequence]

1) Select bit device setting tab on the data trace setting communication box.
2) Select bit type device. If need to add line or delete line, select menu by right mouse button.

[Communication box]



[Communication box description]

a) The number of setting devices: Display the number of set devices.
b) Setting data size: Display setting data size. If need to set devices more than one, it is displayed by 2 byte.
c) Device catalogue: Display set device catalogue.

Notes

Device can be set max 8 with word device and bit type device.

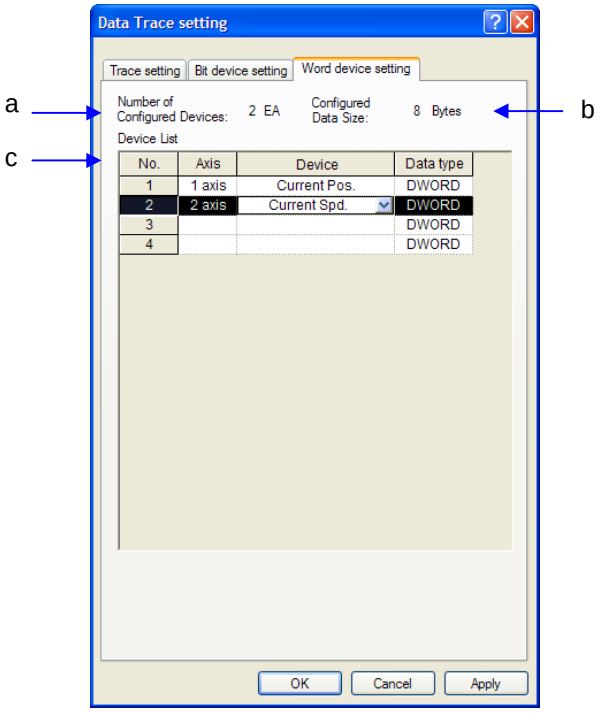
(4) Word device setting

Select word device for collecting data. Word graph display selected device.

[Sequence]

1) Select word device setting tab on the data trace setting communication box.
2) Select word type device. Select menu by mouse right button, when need to add or delete line.

[Communication box]



[Communication box description]

a) The number of setting devices: Display the number of set word devices.
b) Setting data size: Display setting data size. Size is decides by set data type.
c) Device catalogue: Display set word device catalogue.

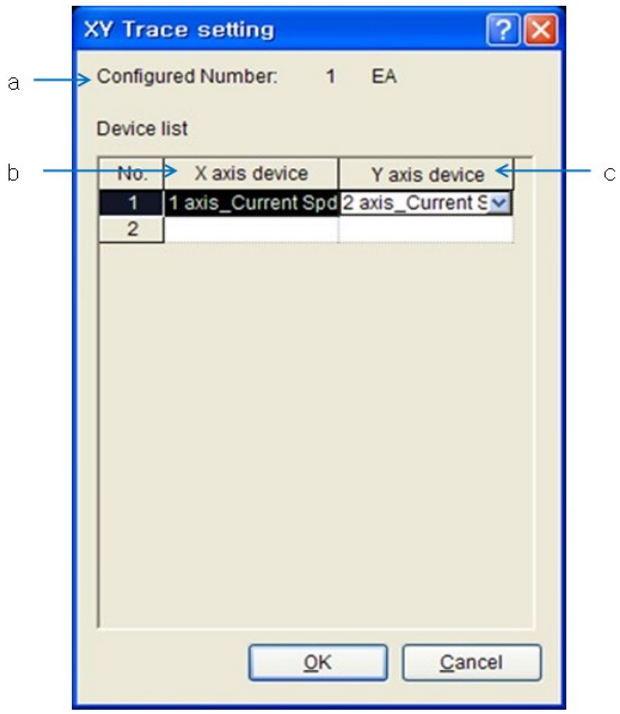
11.7.3 XY Trace Setting

XY trace setting after proceed data trace that it display 2D data on the XY coordinate by recorded word device, set X device, Y device.

[Sequence]

1) Revitalize XY graph tab.
2) Revitalize menu by click right button, select [XY trace setting] menu.

[Communication box]



[Communication box description]

a) Configured Number: Display the number of XY devices. Have to set axis X device and axis Y device for increasing a device.
b) X axis device: Set device for recording on the axis X.
c) Y axis device: Set device for recording on the axis Y.
d) OK: Save XY trace setting and end communication box.
e) Cancel: End communication box.

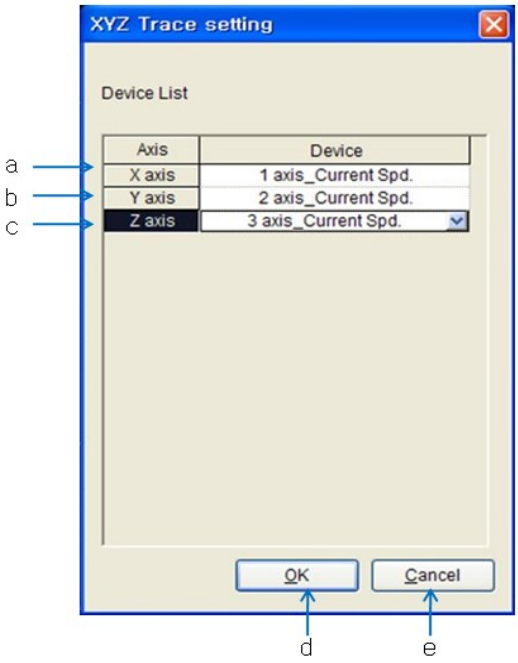
11.7.4 XYZ Trace Setting

Set axis X,Y,Z devices to display 3D data on the XYZ coordinates by recorded word device.

[Sequence]

1) Revitalize XYZ graph tab.
2) Click right button to revitalize menu, select [XYZ trace setting] menu.

[Communication box]



[Communication box description]

a) Axis X device: Set device to record on the axis X.
b) Axis Y device: Set device to record on the axis Y.
c) Axis Z device: Set device to record on the axis Z.
d) Confirm: Save XY trace setting and end communicator.
e) Cancel: End communication box.

Notes

XY trace setting and XYZ trace setting not save to module.

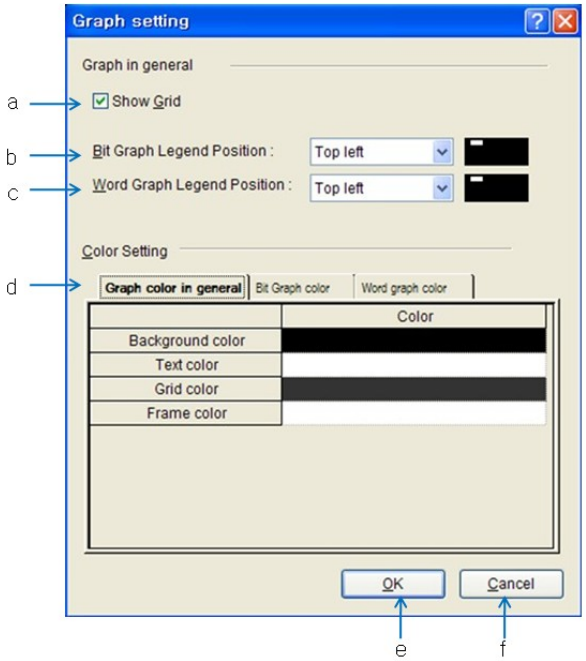
11.7.5 Graph Setting

Set graph of trend graph tab.

[Sequence]

1) Revitalize trend graph tab.
2) Proceed menu [Graph]->[Graph setting].

[Communication box]



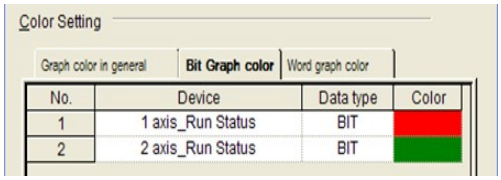
[Communication box description]

a) View grid : Decides whether setting display grid on the screen or not.
b) Bit graph index position: Set position of bit graph index.
c) Trend graph index position: Set position of trend graph index.
d) Index setting: Set general color and device color of graph background.
e) Confirm: Apply change and close communication box.
f) Cancel: Close communication box.

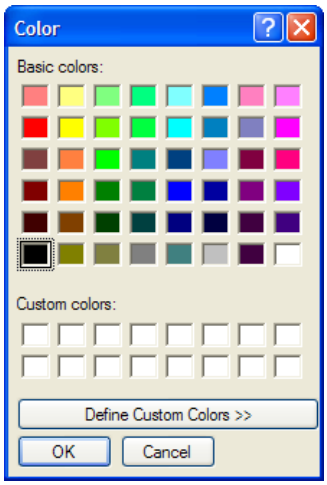
(1) Graph color setting method

[Sequence]

1) Select line for changing graph color.



2) Click color line. Communication box to be displayed, if click the color line. Select communication box and confirm.



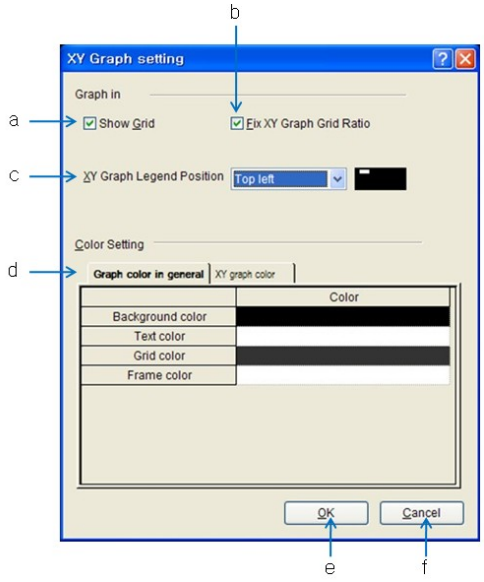
11.7.6 XY Graph Setting

Set graph of XY graph tab.

[Sequence]

1) Revitalize XY graph tab.
2) Proceed menu [Graph]->[Graph setting].

[Communication box]



[Communication box description]

a) View Grid: Decides whether setting display XY grid.
b) Set XY graph grid rate: Set grid rate of XY graph. When it check, grid vertical and horizontal rates are same. When it uncheck, display rate with screen rate.
c) XY graph index position: Set position of X graph index.
d) Color setting: Set device color and general color of graph backround.
e) Confirm: Close communication box after setting.
f) Cancel: Close communication box.

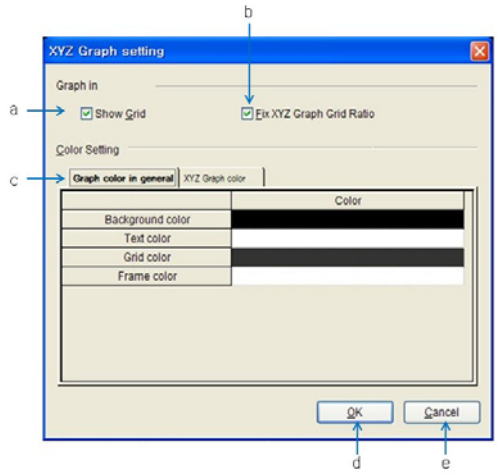
11.7.7 XYZ Graph Setting

Set XYZ graph tab.

[Sequence]

1) Revitalize XYZ graph tab.
2) Proceed menu [graph]->[graph setting].

[Communication box]



[Communication box description]

a) View grid: Decides whether setting XYZ grid or not.
b) Fix XYZ graph grid rate: Set grid rate on the XYZ graph. When it check, grid vertical and horizontal rates are same. When it uncheck, display rate with screen rate.
c) Color setting: Set device color and general color of graph background.
d) Confirm: Close communication box after changing.
e) Cancel: Close communication box.

11.7.8 Trace

Read traced data from module or read setting.

(1) Write trace setting

Apply trace setting to module.

[Sequence]

1) Proceed menu [trace]->[Writing trace setting].

(2) Read trace setting

Read trace setting from module.

[Sequence]

1) Proceed menu [Trace]->[Read trace setting].

Notes

When proceed data trace with XG-PM, first trace setting read is automatically start one time.

(3) Reading Trace

Read data of trace result from module.

[Sequence]

1) Proceed menu [Trace]->[Reading trace].

(4) Starting manual trace

Begin to data trace by current set trace condition.

[Sequence]

1) Proceed menu [Trace]->[Starting manual trace]. If it is tracing now, menu to be inactivated.

(5) Stopping manual trace

Manual trace stop make stop trace and read data to present.

[Sequence]

1) Proceed menu [Trace]->[Stopping manual trace]. It is revitalized only operate previous trace menu.

11.7.9 Playing Trace

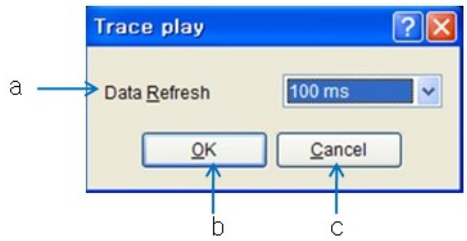
It is displayed by trace data that it read from module with time.

(1) Play setting

[Sequence]

1) Proceed menu [Playing trace]->[Play setting].

[Communication box]



[Communication box description]

a) Renew data period: Set renew period of data sample.
b) Confirm: Close communication box with applying change.
c) Cancel: Close communication box.

(2) Start

Begin to play trace. Playing trace is revitalized only, when there are trace data.

[Sequence]

1) Proceed menu [trace playing]->[Play setting].

(3) Pause

Pause trace.

[Sequence]

1) Proceed menu [Playing trace]->[Playing pause/continue].

(4) Continue

Continue paused trace.

[Sequence]

1) Proceed menu [Playing trace]->[Playing pause/continue].

(5) Stop

End playing trace.

[Sequence]

1) Proceed menu [Renew playing trace]->[Stop playing].

11.7.10 Graph Function

Refer to graph function(11.7.4) of this manual 11.7 trend monitor.

11.7.11 File Function

Save trace setting, read setting from file.

(1) Open

[Sequence]

1) Proceed menu [File]->[Open].
2) Confirm after selecting the file on file communication box.

(2) Saving

[Sequence]

1) Select menu [File]->[Save].
2) Input file name that it need to save on the file saving communication box and confirm.

(3) Save as …

[Sequence]

1) Proceed menu [File]->[Save as …].
2) Input file name that it need to save as other name and confirm.

(4) Save bitmap

Save present graph as bitmap file.

[Sequence]

1) Proceed menu [file]->[out] ->[Save bitmap].
2) Input file name what you need to save and confirm.

(5) Save text

Save graph data as text file. To be saved data as the number of datas on the current screen.

[Sequence]

1) Proceed menu [File]->[Out] ->[Save text].
2) Input file name what you need to save and confirm.

(6) Copy clipboard

Graph on the present screen, Copy to window clipboard.

[Sequence]

1) Proceed menu [File]->[Out] ->[Copy clipboard].

11.7.12 View Function

Display or hide tool bar and status bar.

(1) View tool bar

[Sequence]

1) Select/Cancellation menu [View]->["Tool name"].

Notes

"Tool name"include file tool/trace tool/graph tool/recycle tool.

(2) View status bar

[Sequence]

1) Select/Cancellation menu [View]->[Status bar].

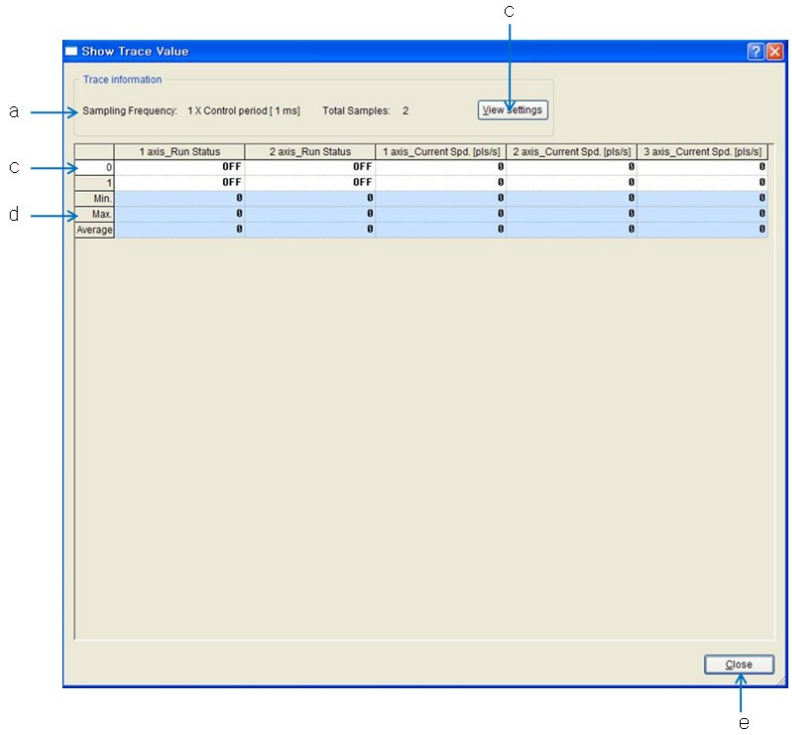
(3) View data

Display Trace data by value. View data item is revitalized with trace data only.

[Sequence]

1) Proceed menu [view]->[View data].

[Communication box]



[Communication box description]

a) Sampling Frequency: Display scan period by trace setting.
   The number of total samples: Display the number of collected total samples.
b) View settings: Display trace setting communication box.
c) Data: Display data trace result value in order of sample. Sample data display the number of collected samples on the basis of a trace time-point.
d) Min/Max data, average value.
e) Close: Close communication box.

11.8 Electronic CAM

XG-PM provies function that it creates electronic CAM profile and operate electronic CAM. User proceed “editing cam data and confirm → Download to module → Cam operation command” for CAM operation.

This is a sequence of operating electronic CAM.

Sequence	Contents
Select CAM block	Select one of 8 CAM block for setting.
Setting CAM control mode	Set CAM control mode. When make increasing profile to one direction or repeat one section, set repeat mode.
Setting Main axis/Sub axis parameter	Set main/sub parameter. Refer to 8.4 electronic CAM setting for details.
Setting CAM block data (Considering characteristic curve)	Set CAM data of selected block. Refer to 8.4 electronic CAM setting for details.
Creating profile	Create CAM profile by set blockdata.
Confirm graph and data	Confirm created profile by graph and data. If user want to modify profile, reset CAM block data.
Download CAM block data	Download profile to module.
Operating CAM by command	Operate CAM profile that it is saved on module by command.

11.8.1 Creating electronic CAM profile

Refer to 8.4 electronic CAM setting for CAM data setting and CAM profile creation proceeding.

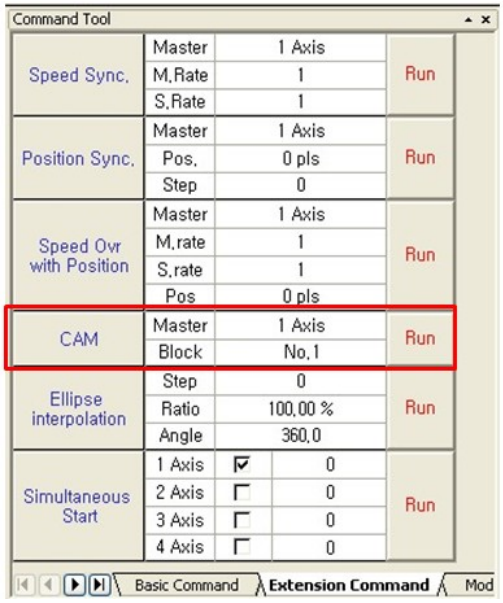
11.8.2 Proceeding electronic CAM

Operate electric CAM of XG-PM after downloading CAM profile to module XG-PM.

[Sequence]

1) Select axis command. (Select from command tool)
2) Set main axis from item of expansion command window CAM operation.
3) Select CAM block.
4) Click confirm button.

[Setting screen]



Appendix 1. What is the difference APM software package with XGPM

Appendix1.1 Difference function

PADT / Item	APM Software package	XG--PM
Support module	1) XGF-PO1A /PO2A/PO3A (3 type) 2) XGF-PD1A/PD2A/PD3A (3 type)	1) XGF-PO1H/PO2H/PO3H/ PO4H (4 type) 2) XGF-PD1H/PD2H/PD3H/PD4H (4 type)
Programming structure	1) a module programming method 2) Cannot comparison operation data/parameter screen at once. 3) No support copy/attach parameter/operation data on the project tree.	1) Multi module programming method 2) Support comparing Operation data/Parameter screen at once 3) Function of copying/attaching parameter/profile data.
Editorial function	No support data copy. attach without same item. No support /Undo/Redo.	Support function for data copy/ attach/ Undo/ Redo with difference item.
Parameter detail setting	No support	Provide parameter detailed setting function with help (Description + Graphic)
Online module setting	One module online function	1) Online synch function (It is possible that it synchronize module information on system and project structure on the program.) 2) Multi module online function
Read data/ Write/ Comparison with module	No support	Support comparison function of read/write/module project. (Multi module)
Communication sharing	It is impossible that it share communication port with other software.	It is possible that it share communication port with XG5000 software.
Module O/S download	No support	Support download function of multi module O/S.
File Import/Export	No support	Can save and load as operation data/operation parameter file.
Monitoring	Not provides graphic monitor function.	Graphic monitoring (System monitor, Display module OS information.)
Trace	Provides data Tracking function.	Data trace , X/Y trace, XYZ trace function.
Simulation	Profile/ Circular interpolation simulation	Operation simulation
Print	Provide a module printing function.	Provide project printing function. (Print multi module)
CAM setting function	No support	CAM profile setting(22 type), Data analysis/ Display editorial CAM graph.
Help	Descript basic operation.	Menu tool tip each function and promote help.

Warranty

1. Warranty Period

The product you purchased will be guaranteed for 18 months from the date of manufacturing.

2. Scope of Warranty

Any trouble or defect occurring for the above-mentioned period will be partially replaced or repaired. However, please note the following cases will be excluded from the scope of warranty.

(1) Any trouble attributable to unreasonable condition, environment or handling otherwise specified in the manual,
(2) Any trouble attributable to others' products,
(3) If the product is modified or repaired in any other place not designated by the company,
(4) Due to unintended purposes
(5) Owing to the reasons unexpected at the level of the contemporary science and technology when delivered.
(6) Not attributable to the company; for instance, natural disasters or fire

3. Since the above warranty is limited to PLC unit only, make sure to use the product considering the safety for system configuration or applications.

Environmental Policy

LS Industrial Systems Co., Ltd supports and observes the environmental policy as below.

Environmental Management

LS Industrial Systems considers the environmental preservation as the preferential management subject and every staff of LS Industrial Systems use the reasonable endeavors for the pleasurably environmental preservation of the earth.

About Disposal

LS Industrial Systems' PLC unit is designed to protect the environment. For the disposal, separate aluminum, iron and synthetic resin (cover) from the product as they are reusable.

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2009. 8